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ABSTRACT

The purpose of this study was to collect a bank of data on the teaching of science that could serve as a basis of comparison for trend analysis. The information obtained in this survey provides a description of science teaching practices and selected science teacher characteristics in the United States. Comparisons with data to be obtained in future studies will help decision makers regarding changes taking place in programs, instruction, facilities, and teacher education. The data are organized according to eight regions of the country: Great Lakes, Farwest, New England, Mideast, Southwest, Rocky Mountains, Plains, and Southeast. A total of 276 variables were included in the data-gathering questionnaires. These variables are reported in one of the following six categories: school organization, scheduling, and enrollment variables; use of resources variables; science course variables; science course improvement project variables; teacher characteristics and background; and teaching practices, preferences, and concerns. The means, standard deviations, and number of responses for each of the variables for each of the regions were computed, and results are given for correlation and multiple regression analyses of selected variables. Both the principal's and the science teacher's questionnaire are included as appendices. (Author/MH)

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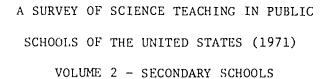
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THE ERIC SCIENCE, MATHEMATICS AND ENVIRONMENTAL EDUCATION CLEARINGHOUSE in cooperation with Center for Science and Mathematics Education The Ohio State University

SCIENCE EDUCATION REPORTS

A SURVEY OF SCIENCE TEACHING IN PUBLIC SCHOOLS OF THE UNITED STATES (1971)

VOLUME 2 - SECONDARY SCHOOLS

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1974

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Preface

The purpose of this study was to collect "bench mark" data on the teaching of science that could serve as a basis of comparison for trend analysis. The information obtained in this survey provides a description of science teaching practices and selected science teacher characteristics in the United States. Comparisons with data to be obtained in future studies will help decision makers regarding changes taking place in programs, instruction, facilities and teacher education.

This monograph provides results of correlation and multiple regression analyses of selected secondary school and teacher variables. It is a companion to Volume 1 which provides descriptive information on the teaching of secondary school science obtained in the survey. Both of these volumes utilize and consolidate regional data collected in individual doctoral studies by Chin (1971), Buckeridge (1973) and Baker (1973). A similar pair of monographs provides descriptive and correlation and multiple regression results regarding the teaching of elementary school science.

This trend analysis project will be continued by another national survey. We have used information obtained in the 1970-71 survey to answer many requests for information at ERIC/SMEAC and believe there is interest and need for similar information collected on a periodic basis.

The authors are grateful for assistance provided by James Kozlow and Edith Santana. The computer data analyses provided by Mr. Kozlow and Mrs. Santana provided considerable assistance in preparing the final report.

Robert W. Howe Director ERIC/SMEAC

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Section I

Introduction

A national survey of science teaching was conducted by the Faculty of Science and Mathematics Education at the Ohio State University during the 1970-71 school year. The purpose was to establish a data bank of information concerning science teaching in the public schools in the fifty states of the United States and the District of Columbia.

The survey was designed to collect data from a sample of public schools in all states of the United States. The data was organized by regions which were based on the divisions formulated in the Brown and Obourn study of 1963 (Chin, 1971). The regions included were: Great Lakes, Farwest, New England, Mideast, Southwest, Rocky Mountains, Plains, and Southeast.

The survey had a number of unique features. Sampling techniques were used which insured that the ratio of the enrollments of schools sampled per region to the total enrollment of schools sampled was the same as the ratio of the regional population enrollments to the total school population enrollments.

Sampling Procedures

Selection of Public Secondary Schools*

The method of obtaining the sample of public secondary schools involved the following steps:

1. The number of public secondary schools to be selected from each state and the District of Columbia was computed on the basis of the ratio of the State or District of Columbia total secondary school enrollment. Thus,

nstate =
$$\frac{N_{state}$$
 (S) x N $\frac{N_{total}}{N_{total}}$ (S)

where n state ** the number of public secondary schools to be sampled in the respective state

 $\frac{N}{\text{state}}$ (S) = secondary school enrollment in the state

 $^{
m N}$ total (S) = total U.S. secondary school enrollment

N = sample size = 6,398 public secondary schools.

^{*} Buckeridge, Ellen C. A Survey of Science Teaching in the Public Secondary Schools of the New England, Mideast, and Southwest States of the United States, unpublished Ph.D. dissertation, The Ohio State University, 1973.



Example: State of Massachusetts

 $N_{\text{Massachusetts}}$ (S) = 460,609 secondary school students

 N_{total} (s) = 17,543,239 secondary school students

Hence,
n
Massachusetts = $\frac{460,609}{17,543,239}$ X 6,398

= 166 public secondary schools

i.e., 166 public secondary schools were sampled from the population of public secondary schools in Massachusetts.

2. The unit population for each state was computed as follows:

Unit population =
$$\frac{N_{state}}{n_{state}}$$

where N_{state} (E,S) = school enrollment (elementary and secondary) for the state.

Example: State of Massachusetts

 $N_{\text{Massachusetts}}$ (E,S) = 1,046,950 students

 $^{
m n}$ Massachusetts \sim 166 public secondary schools

Hence, the unit population for Massachusetts = $\frac{1,046,950}{166}$

- = 6,301 students per public secondary school sample unit
- 3. School districts in each state were first grouped by county. The total school enrollment (elementary and secondary) of all school districts in a county was computed. This figure was divided by the unit population for that state to determine the number of public secondary schools to be sampled from the county. An example is used with Berkshire County, Massachusetts.

Example: Berkshire County, Massachusetts

Total school enrollment in Berkshire County = 29,281. Unit population for Massachusetts = 6,301.

Number of public secondary schools sampled from the population of public secondary schools in Berkshire County, Massachusetts =

$$\frac{29,281}{6,301}$$
 = 4.6



4. If the total school enrollment in a county was less than one half that of the unit population, then the county was combined with one or more neighboring counties so as to equal to one, two or more times the unit population. The number of public secondary schools to be sampled from this group of counties was determined by dividing the combined school enrollment by the unit population. An example used with Duke, Nantucket and Barnstable Counties, Massachusetts follows.

Example: Combining Neigh. ing Counties - Duke, Nantucket, and Barnstable Counties, Massachusetts

Total school enrollment in Duke County = 832 students Total school enrollment in Nantucket County = 791 students Total school enrollment in Barnstable County = 20,987 students Combined school enrollment in Duke, Nantucket, and Barnstable Counties = 22,610 students.

Number of public secondary schools sampled in Duke, Nantucket, and Barnstable Counties = $\frac{22,610}{6,301}$ = 4 to nearest whole number.

5. In the case of large school districts within a county, the total school enrollment in each school district was divided by the unit population to determine the number of public secondary schools to be sampled from each district. An example is used with the Pittsfield Public School District in Berkshire County, Massachusetts.

Example: Pittsfield Public School District

Total school enrollment in the Pittsfield Public School District = 12,302 students.

Number of public secondary schools sampled from this school district

=
$$\frac{12,302}{6,301}$$
 = 2 to the nearest whole number

6. In the case of small school districts within a county, two or more neighboring districts were combined, and their total school enrollment was divided by the unit population to determine the number of public secondary schools sampled in the combined districts. An example is used with the Adams, Berkshire Hills, Central Berkshire, and Chesire School Districts in Berkshire County, Massachusetts.

Example: Combining School Districts - Adams, Berkshire Hills, Central Berkshire and Chesire, Berkshire County, Massachusetts

Total school enrollment in the Adams Schools District = 2,229 students Total school enrollment in the Berkshire Hills School District = 1,118 students

Total school enrollment in the Central Berkshire School District \Rightarrow 819 students

Total school enrollment in the Chesire School District = 466 students Combined school enrollment = 4,632 students.



Number of public secondary schools sampled from the Adams, Berkshire Hills, Central Berkshire, and Chesire School Districts

=
$$\frac{4,632}{6,301}$$
 = 1 to the nearest whole number

7. The individual public secondary schools were then randomly selected from an alphabetical listing of all public secondary schools in the selected school district or a combination of school districts. Tables of random numbers were used in this phase of the sampling. The principals of selected public secondary schools received the Principal's Questionnaire. The total number of schools selected from a state may deviate slightly from the identified number due to rounding off area populations.

Selection of Secondary Science Teachers

Stage 2 of the multi-stage random sampling technique involved the random selection of the science teacher within the selected schools. The principals were given specific directions indicating how the random numbers could be used to select the teacher from an alphabetical listing of the science teachers in their respective schools. (Chin, 1971).

Selection of Secondary Science Classes

Stage 3 was that stage in which a specific science class was chosen from the total number of classes taught by the preselected science teachers. They were directed to use random selection to determine one class from which they would give the data requested in the questionnaire. Specific directions were provided to assist the teacher in this selection. (Chin, 1971). (See Appendix A, Science Teacher Questionnaire, page

Questionnaires were sent to both the school principal and a science teacher on the staff so that relationships between organizational variables and teaching practices could be made. Two studies were conducted concurrently. One was at the secondary level and the companion study at the elementary level to provide K-12 data.

The purpose of the overall national survey was to obtain descriptive information concerning the practices, procedures, policies and conditions related to the teaching of science in the public schools of the United States as they existed during the 1970-71 school years. This report deals only with the secondary level data collected from the principals and the teachers of the schools and is a followup and extension of the descriptive report by Schlessinger, Howe, White, Chin, Baker, and Buckeridge (1973). Included is a discussion of the correctional analyses of the data derived from the Principal's Questionnaire and the Science Teacher Questionnaire.

Design of the Study

The population for this survey included all public secondary schools in the 50 states and the District of Columbia. Based on a sample of 10,000 public



elementary schools in the companion survey of elementary school science teaching practices, the sample size for this survey was computed to be 6,398 public secondary schools. These sample sizes reflect the ratio of the total elementary school enrollment to the total secondary school enrollment in the population. The sample of 6,398 public secondary schools represents 25.2 percent of the public secondary schools in the United States. (Kahn & Hughes, 1969).

Figure 1 represents the geographic distribution of the public secondary schools to be sampled per state for the survey.

The states included in each of the regions are as follows:

Great Lakes: Illinois, Indiana, Michigan, Ohio, Wisconsin.

Farwest: Alaska, California, Hawaii, Nevada, Oregon, Washington.

New England: Connecticut, Maine, Massachusetts, New Hampshire,

Rhode Island, Vermont.

Mideast: Delaware, District of Columbia, Maryland, New Jersey,

New York, Pennsylvania.

Southwest: Arizona, New Mexico, Cklahoma, Texas.

Rocky Mountains: Colorado, Idaho, Montana, Utah, Wyoming.

Plains: Iowa, Kansas, Minnesota, Missouri, Nebraska, North

kota, South Dakota.

Southeast: Alabama, Arkansas, Florida, Georgia, Kentucky,

Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, West Virginia, Virginia.

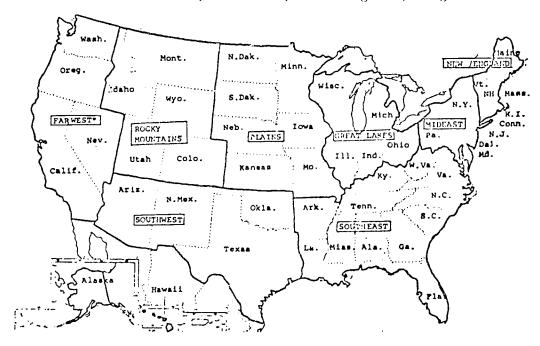


Figure 1. State Groupings



The actual number of schools and teachers selected for the sample was 6,298. The figure is less than the calculated figure because of the grouping procedures used in sampling. Counties or other units were grouped to get a large enough student population to warrant one or more schools being sampled in the area. This and the round off effect reduced the actual number of units to be sampled.

Communications were received from approximately 95 percent of the schools. These communications varied all the way from indicating they were not interested in filling out the questionnaires to returning the questionnaires completed. Completed questionnaires were received from 2,489 principals and 2,467 teachers and were used in the report by Schlessinger, et al. (1973).

This report includes correlational analyses and therefore it was necessary to have matching sets of teacher and principal responses. Since some principals responded in schools where the teacher did not and some teachers responded in schools were the principal did not the sample size for analysis was further reduced. The matching of teacher and principal responses resulted in 2,193 complete sets of data for the correlational analyses. This is 34.8% of the original sampling. The original sample, the correlation analysis sample, and the percent of the original sample included in correlation sample are reported in Table 1.

TABLE 1

FREQUENCY AND PERCENTAGE OF PRINCIPAL AND TEACHER QUESTIONNAIRE RESPONSES USED IN CORRELATION SAMPLE

	Great Lakes	Parwest	New England	Mideast	Southwest	Rocky Mountains	Plairs	Southeast	Total U.S.
Schools Samples	1214	855	336	1228	588	201	47 L	1405	6298
Correlation Sample	459	314	130	-435	182	85	225	063	2193
Percent	37.8	36.7	38.7	35.4	31.0	42.3	47.3	25.8	34.8

Effect of Non-response and Incomplete Questionnaires on Analysis

Several analyses were conducted to determine the possible effect of non-responses and the removal of questionnaires from the analyses.

Analyses were conducted to determine which schools did or did not respond and the possible impact of those schools on the analyses. The analyses were conducted in three ways: (1) determining whether non-responding schools differed from those that did respond regarding school size, school location, and type of school; (2) analyzing principal and teacher returns from schools with a single response to compare data from those with two responses; and (3) checking non-responding schools in detail in two states (Ohio and Oregon) and a sample of 30 other schools from other states.

Analyses of data by regions indicated no significant differences using X^2 (.05 level) between non-responders and responders on items checked. Analyses of non-responders in two states and a sample of 30 schools selected from other states indicated non-responders would have little if any impact on the regional data. Data for small states would change, but these changes would not have substantial impact on regional or national data.



Data-Gathering Instruments

The data were gathered by means of two structured questionnaires, the Principal's Questionnaire and the Science Teacher Questionnaire. These instruments are included in Appendix A. The Principal's Questionnaire was designed to provide data for all the science teachers and science classes in the school. The instrument included 26 items grouped into seven sections:

- 1. Screening Questions
- 2. School Organization and Scheduling
- 3. Grouping of Science Classes
- 4. Teaching Staff
- 5. Science Budget
- 6. Course Offerings
- 7. Miscellaneous

The Science Teacher Questionnaire was designed to provide information concerning specific characteristics of secondary school science teachers, the conditions under which they taught science, and the learning activities involved in their teaching of science. This instrument included 25 items grouped into six sections:

- 1. School Organization
- 2. Teacher Characteristics
- 3. Teaching Load
- 4. Special Science Facilities and Audio-Visual Aids
- 5. Science Teaching
- 6. Miscellaneous

Data Analysis

The means, standard deviations, and number of responses for each of the variables for each of the eight regions were computed. For the purposes of the correlational analysis, schools which did not have a particular grade level were deleted when considering the enrollment for grade levels which they did not have. For instance, a 9th through 12th grade high school was not included when correlations were computed relating 7th or 8th grade enrollments with other variables. A school of this type would be included when correlations were computed relating 9th, 10th, 11th, or 12th grade enrollments with other variables.

To investigate the influence of school size and school type (junior high, senior high, or combination) on the correlational \mathbf{r} elationships four stepwise multiple regression analyses were performed:

- 1) Analysis #1: All variables were allowed to enter in the order which added the most to the prediction equation.
- 2) Analysis #2: The Total Student Enrollment Variable was forced to enter first, thus partialling out its relation with the variable to be predicted. The remaining variables were then allowed to enter stepwise in the order which added the most to the prediction equation.



- 3) Analysis #3: School Type was forced to enter first followed by the stepwise analysis. School Type was composed of three dichotomous variables. They were:
 - (a) schools including both junior and senior high school students (Type J-Sr).
 - (b) schools including senior high school students only (Type-Sr).
 - (c) schools including junior high school students only (Type-Jr).
- 4) Analysis #4: Both School Type and Total Student Enrollment were forced to enter and then the stepwise analysis followed.



Section II

Variables

The questionnaires were used to collect data on 276 variables overall. Not all of these variables were included in the correlational analyses. Some of the variables were nominal, some resulted in 75 to 100 percent of the subjects responding in the same manner, some were not of particular interest and some resulted in ambiguous responses due to misinterpretation by the respondents. Some of the variables were combined by transgeneration to produce new variables. The number of variables resulting from these processes was 89. These variables are listed in Table 2.

These variables have been divided into six categories for the purpose of reporting. These categories are as follows:

- A. School organization, scheduling and enrollment variables (1, 6-17, 34, 35).
- B. Use of resources variables (2-5, 19-24, 43-45).
- C. Science course variables (46, 84-88).
- D. Science Course Improvement Project variables (18, 29-33).
- E. Teacher characteristics and background (25-28, 36-42, 73-83, 89).
- F. Teaching practices, preferences and concerns (47-72).

The 26 variables in Table 2 which are preceded by a # symbol were used as dependent or criterion variables in the following analyses. They include Science Course Improvement Project usage variables, teacher self-improvement activities, teaching practice preferences of teachers and teacher satisfaction with career. The means, standard deviations, and number of responses for each of these variables for each of the eight regions are given in Tables 3-8.



TABLE 2

NAMES, ABBREVIATIONS AND CODINGS FOR VARIABLES

No.	Abbreviation	Hame	<u>Code</u>
f 1	Grouping	Homogeneous Grouping in Science Classes	2 = yes, 1 = no
	Teach Buy Eq	Teacher Purchase of Science Equipment and Supplies	2 = yes, 1 = no
3	NDEA Eq	Use of NDEA Funds for Science Equipment	2 = yes, 1 = no
4	ESEA Eq	Une of ESEA Funds for Science Equipment	2 = yes, 1 = no
5	MDEA Remod	Use of NDEA Funds for Remodelling Science Facilities	2 - yes, 1 - no
6	Roll GS	Enrollment for General Science	Number
7	Roll Life	Enrollment for Life Science	Number
8	Roll Bio	Enrollment for Biology	Number
9	Roll Chem	Enrollment for Chemistry	Number
	Roll Physics	Enrollment for Physics	Number
11	Roll Earth	Enrollment for Earth Science	Number
12	Roll Geol	Enrollment for Geology	Number
13	Roll Phy Sci	Enrollment for Physical Science	Number
14	Roll Health	Enrollment for Health Science	Number
	Type J-Sr	School Type Junior-Senior High	1 = yes, 0 = no
16	Type Sr	School Type Senior High	1 = yes, 0 = no
	Type Jr	School Type Junior High	1 = yes, 0 = no
	SCIP Use	Use of Science Course Improvement Projects	2 = yes, 1 = no
19	Sci Club	Science Club	2 = yes, 1 = no
	Sci Fair	Science Fair Participation	2 = yes, 1 = no
21	City/Count Sup	Use of City or County Supervisors	2 = yes, 1 = no
	Local Cons	Use of Local Consultants	2 = yea, 1 = no
23	Sci Teach Wksp	Science Teaching Methods Workshops	2 = yes, 1 = no
24	Coll Sci Cour	College Science Courses	2 = yes, 1 = no Number
25	Teach Sci Full	Number of Fulltime Science Tunchers	Number
26	Teach Sci H	Number of Male Science Teachers Number of Female Science feachers	Number
27	Teach Sci F	Number of Science Teachers (Fullrime and Parttime)	Number
28 #29	Teach Sci	Enrollments in Physical Science Courses Using Science	
#29	SCIP PS Roll	Course Improvement Projects Materials	Number
#30	SCIP ES Roll	Enrollments in Earth Science Courses Using Science	***************************************
• • • •	3011 23 1011	Course Improvement Projects Materials	Number
#31	SCIP Bio Roll	Enrollments in Biological Science Courses Using betence	
	5011 510 1511	Course Improvement Projects Materials	Number
#32	SCIP Chem Roll	Enrollments in Chemistry Courses Using Science Course	
		Improvement Projects Materials	Number
#33	SCIP Phys Roll	Enrollments in Physics Courses Using Science Course	
	•	Improvement Projects Materials	Number
34	Tot Roll	Total Student Enrollment	Number
35	CAE	Average Grade Level Enrollment	Mean
36	Age	Age of Teacher	Years
37	Sex	Sex of Teacher	2 - male,1 - female
38	Degree Held	Highest Degree Held by Teacher	1 - BS or BA
			2 = MS or MA
			3 = Spucialist
			4 = Ed.D.
			5 - Ph.D.
20	Duna dan	To the Marking Toward Minkey Diggs	2 = 400 1 = 55
#40	Pursuing NSF Inscrv	Teacher Working Toward Higher Degree Teacher Participation in National Science Foundation	2 = yes, 1 = no
F-40	Not Inacta	Inservice Institutes	# of Institutes
#41	NSF Summer	Teacher Participation in National Science Foundation	. Ot institutes
	Jemater	Summer list1 acco	# of Institutes
42	Taught Sci	Secondary School Science Teaching Experience	Years
	Movie Proj	Use of Mation Picture Projector	4 = frequently
44	Slide Proj	Use of Slide Projector	3 - occasionally
45		Use of Overhead Projector	2 = rarely
		•	1 = not used
46	Class /	Enrollment in Class Selected for This Survey	Number



```
#47 Lecture
                          Teacher Ranking of Lecture as Important Learning
                                                                                      4 - most often
                             Activity
                                                                                      3 = second most
  #48 Lect Disc
                          Teacher Ranking of Lecture Discussion as Important
                                                                                      2 = third most
                            Learning Activity
                                                                                      1 - used
  #49
       Sci Demo
                          Teacher Ranking of Science Demonstrations as Important
                                                                                     0 = not used
                             Learning Activity
  #50
       Films
                          Teacher Ranking of Instructional Films as Important
                             Learning Activity
   51 Ind Study
                          Teacher Ranking of Individual Study as Important
                            Learning Activity
  #52 Ind Lab
                          Teacher Ranking of Individual Laboratory as important
                            Learning Activity
  #53 Group Lab
                         Teacher Ranking of Group Laboratory as Important
                            Learning Activity
   54 Cl Assign
                         Teacher Ranking of In-Class Written Assignments as
                            Important Learning Activity
   55 Field Trips
                         Teacher Ranking of a coursions and Field Trips as
                            Important Learning Activity
   56 Prog Inst
                         Teacher Ranking of Programmed Instruction as Important
                            Learning Activity
  57 Auto Tut
                         Teachar Ranking of Auto-tutorial Instruction as
                            Important Learning Activity
 #58 C Tests
                         Teacher Ranking of Test Scores as Impricant Grading
                            Method
 #59 Writ Assign
                         Teacher Ranking of Written Assignments as Important
                           Grading Method
 $60 Part Class
                         Teacher Ranking of Student Participation in Class as
                            Important Grading Method
 #61 Perf Lab
                         Teacher Ranking of Student Performance in Laboratory
                            as Important Grading Method
  62 Sci Proj
                        Teacher Ranking of Student Performance on Science Projects as Important Grading Method
  63 Interest
                         Teacher Ranking of Student Interest in Science as
                            Important Grading Method
  64 Innovation
                        Teacher Ranking of Innovative Programs as Important for
                                                                                     5 - very important
                           High Quality Science Programs
  65 Admin Supp
                        Teacher Ranking of Administrative Support as Important
                                                                                          ĽΟ
                           for High Quality Science Programs
  66
     Sci Fac
                        Teacher Ranking of Science Facilities as Important for
                                                                                      - not important
                           High Quality Science Programs
  67 Salary
                        Teacher Ranking of Teacher Salaries as Important for
                           High Quality Science Programs
  68
     Inservice
                        Teacher Ranking of Inservice Education as Important for
                           High Quality Science Programs
     Coop Staff
                        Teacher Ranking of Cooperative Staff as Important for
                           High Quality Science Programs
 70
     Small Classes
                        Teacher Ranking of Small Classes as important for High
                           Quality Science Programs
                        Teacher Ranking of Small Number of Different Preparations
 71 Preps
                           as Important for High Quality Science Program
 72 Load
                        Teacher Ranking of Teacher Load on Important for High
                           Quality Science Programs
#73 Satisfaction
                        Teacher Satisfaction With Science Teaching as a Career
                                                                                    5 - very satisfied
                                                                                    4 - satisfied
                                                                                    3 = neutral
                                                                                    2 - dissatisfied
                                                                                    1 = very
                                                                                        dissatisfied
 74
     Hrs Bio
                        Teacher's College Biological Science Credits
                                                                                    Semester Hours
 75
     Hrs Phy Sci
                        Teacher's College Physical Science Credits
                                                                                    Semester Hours
     Hrs Earth
                       Teacher's College Earth Science Credity
                                                                                    Semester Hours
 77
     Hrs Math
                        Teacher's College Mathematics Credits
                                                                                    Semester Hours
 78
     Hrs Sci
                        Teacher's College Science Credits
                                                                                    Semester Hours
£79
     SCIP Bio TE
                        Teaching Experience Using Biology Science Course
                           Improvement Project Materials
                                                                                    1 = yes, 0 = no
#80 SCIP Chem TE
                        Teaching Experience Using Chamistry Science Course
                           Improvement Project Materials
                                                                                    1 = yes, 0 = no
18
    SCIP Earth TE
                       Teaching Experience Using Earth Science Science Course
                          Improvement Project Materials
                                                                                    1 - yes, 0 - no
#82 SCIP Phys TE
                       Teaching Experience Saing Physics Science Course
                          Improvement Project Materials
                                                                                    1 = yes, 0 = no
#83
    SCIP PS TE
                       Teaching Experience Using Physical Science Science
                          Course Improvement Project Materials
                                                                                    l = vas. 0 = no
     Course 310
                        Biology Course Chosen for This Survey
                                                                                    1 = yes, 0 = no
     Course Chem
                       Chemistry Course Chosen for This barvey
                                                                                   1 - yes, 0 - no
     Gurse Earth
                       Earth Science Course Chosen for this Survey
                                                                                   1 - Yes. 0 - 10
                       Physics Course Chosen for This Survey
 87
     Course Physics
                                                                                    1 = yes, 0 = no
88
     Course Phy Sci
                       Physical Science course Chosen for Ihis Survey
                                                                                   1 - Vee, 0 - no
189
    NSF
                       Teacher Participation in Mational Science Foundation
                          Institutes
                                                                                   1 * vas. () = no
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TABLE 3

MEANS AND STANDARD DEVIATIONS FOR TWENTY-SIX DEPENDENT VARIABLES

		Great Lakes	Farvest	New England	Mideast	Southwest	Rocky Sountains	Plates	Southeast	Total # S
8-4 6	Y			ica Englina	. ir uc as c	Southwest	aome arns	PIMIES	Southeast	rotar o.s
Science Course Project Usage V		•								
Variable 18	Mean	1.76	1.81	1.79	1.57	1.38	1.67	1.59	1.41	1.53
	S.D.	0.42	0.39	0.41	0.50	0.49	0.47	0.49	0.49	0.49
	N	459	309	130	433	182	85	223	363	2184
Variable 29	Mean	44.51	32.83	49.25	29.10	44.24	47.13	59.46	43.57	41.52
	S.D.	121.03	93.76	101.22	91.32	184.93	103.82	125.17	130.04	119.51
	N	459	314	130	435	182	85	225	363	2193
Variable 30	Mean	18.32	8.86	20.07	19.85	14.65	28.58	38.06	13.42	18.69
	S.D.	60.04	33.26	69.61	77.54	62.67	71.17	105.96	64.70	69.33
	N	459	314	130	435	182	85	225	363	2193
Variable 31	Mean	125.59	162.49	126.29	96.03	60.01	102 (8	00 (9	61.07	106 33
ARTIONIE JI	Mean S.D.	218.09	210.50	171.20	363.43	69.81 165.16	102.48	99.48 474.18	61.97	106.32
	N. D.	459	314	171.20	435	182	156.18 85	225	141.35 363	273.17 2193
Variable 32	Mean	38.44	48.66	48.94	23.90	15.81	22.49	28.93	14.12	30.14
	S.D. N	77.36 459	70.14	89.38	60.62	51.13	50.44	93.80	55.36	70.88
	N	439	314	130	435	182	85	225	363	2193
Variable 33	Mean	19.53	22.97	24.69	15.93	10.47	11.36	19.85	5.76	16.30
	S.D.	39.38	36.61	46.66	45.60	29.88	26.62	67.43	19.50	41.47
	N	459	314	130	435	182	85	225	363	2193
Variable 79	Mean	0.23	0.27	0.23	0.14	0.19	0.14	0.19	0.13	0.19
	S.D.	0.42	0.44	0.42	0.35	0.39	0.35	0.39	0.34	0.39
	N	459	314	130	435	182	85	225	363	2193
Variable 80	Mean	0.10	0.15	0.12	0.08	0.03	0.11	0.10	0.05	0.09
	S.D.	0.30	0.36	0.32	0.27	0.18	0.31	0.30	6.21	0.28
	N	4 59	314	1 30	435	182	85	225	363	2193
Variable 81	Mean	0.03	0.03	0.04	0.04	0.02	0.09	0.05	0.04	0.04
· - ·	S.D.	0.17	0.18	0.19	0.19	0.15	0.29	0.23	0.21	0.19
	N	459	314	130	435	182	85	225	363	2193
Variable 82	Mean	0.07	0.10	0.15	0.06	0.04	0.02	0.06	0.06	0.07
	S.D.	0.26	0.29	0.35	0.23	0.19	0.15	0.23	0.24	0.25
	н	459	314	1 30	435	182	85	225	3n 3	2193
Variable 83	Mean	0.09	0.09	0.13	0.10	0.08	0.20	0.17	0.10	0.11
	S.D.	0.29	0.29	0.34	0.30	0.28	0.40	0.38	0.30	0.31
	N	459	314	1 30	435	182	85	225	363	2193
eacher Self Imp ctivities Varia										
Variable 40	Mean	0.39	0.51	0.65	0.72	0.38	0.62	0.62	0.42	0.52
	S.D.	0.89	0.93	1.29	1.41	1.01	1.07	1.26	0.80	1.09
	t!	459	314	130	435	182	85	225	362	2192
Variable 41	Mean	1.29	1.42	1.61	1.13	1.19	1.07	1.20	0.89	1.20
AGELODIC 41	S.D.	1.61	1.60	1.85	1.52	1.19	1.38	1.43	1.26	1.52
	N .	459	314	130	435	182	85	225	362	2192
Variable 89	Mean	0.62	0.72	0.48	0.63	0.50	0. (0	0.67	0.60	0.43
variable by	Mean S.D.	0.62	0.72	0.68 0.47	0.62	0.58 0.49	0.69 0.46	0.64	0.58 0.49	0.63 0.48
	N. D.	459	314	130	435	182	85	225	362	2192



TABLE 3 Continued

		Great Lakes	Farwest	New England	Mideast	Southwest	Rocky Mountains	Platns	Southeast	Total U
Teaching Practi Preferences Var										
Variable 01	Mean	1.53	1.47	1.80	1.70	1.47	1.41	1.30	1 40	
	S.D.	0.50	0.50	0.40	0.46	0.50	0.49	0.46	1.49	1.53
	N	453	306	129	431	182	83		0.50	0.50
			300	1.,	431	102	6.0	221	353	2158
Variable 47	Mean	1.07	0.73	1.13	0.88	1.12	0.69	0.75	0.83	0.90
	S.D.	1.30	0.98	1.41	1.21	1.34	0.90	1.04	1.15	1.20
	N	459	313	130	434	182	85	224	362	2189
							0.5		302	2109
Variable 48	Mean	3.09	3.11	3.02	3.14	2.97	2.79	2.92	3.12	3.06
	S.D.	1.27	1.19	1.31	1.27	1.34	1.36	1.40	1.31	1.29
	N	459	313	130	434	182	85	224	362	2189
Variable 49	Mean									
vallable 4)	S.D.	1.17 1.05	1.11	1.31	1.55	1.23	1.26	1.10	1.33	1.27
	ม.		0.91	0.99	1.16	0.95	1.11	0.99	1.08	1.05
	.,	459	313	1 30	434	182	85	224	362	2189
Variable 50	Mean	1.03	1.08	0.48	0.94	0.95	0.85	0.00		
	s.v.	0.84	0.30	0.76	0.80	0.79	0.68	0.98	1.19	1.02
	N	459	313	130	434	182	85	0.80	0.95	0.83
			3.3	170	434	162	6,	224	362	2189
Variable 52	Menn	1.59	1.49	1.28	1.36	1.46	1.60	1.44	1.03	1.39
	S.D.	1.44	1.45	1.37	1.35	1.42	1.60	1.44	1.03	1.40
	N	459	313	130	434	182	85	2.4	362	2193
					• /•	•	ų.		,,,,,	
Variable 53	Mean	2.02	2.25	2.16	1.81	1.81	98	2.08	1.73	1.96
	S.D.	1.35	1.39	1.37	1.36	1.35	1.4:	1.37	1.33	1.37
	N	459	313	130	434	182	85	224	362	2189
Variable 58	Nean	3.45	2.20	2.44						3.35
AU11716 70	S.D.	1.04	3.28 1.08	3.54	3.44	3, 20	3.00	3.40	3.26	1.11
	N. D.	454		0.99	1.05	1.15	1.29	1.10	1.21	2162
		4,4	309	126	4 30	180	85	221	357	2102
Variable 59	Mean	1.92	2.15	1.79	1.57	2.1?	2.27	2.05	1.8/	1.88
	S.D.	1.37	1.22	1.25	1.26	1.3/	1.29	1.30	1.35	1.33
	N	454	309	126	4 10	180	85	221	357	2162
							• •			
Variable 60	Mean	1.11	0.75	1.18	1.49	1.04	0.84	0.91	1.44	1.17
	S.D.	1.23	1.09	1.28	1.35	1.30	1.08	1.13	1.35	1.27
	N	454	309	126	4 30	180	85	221	357	2162
Variable 61	Mean	2.32	2 50	2 40						
· attacte of	S.D.	1.25	2.50	2.48	2.13	2.22	2.06	2.14	1.79	2.19
	N. D.	454	1.25 J09	1.23	1.37	1.21	1.47	1.28	1.48	1.34
	••	4 14	303	176	430	180	85	221	357	2162
eacher Satisfac ariables	tion									
Variable 73	He an	4.55	4.53	4.45						
· 0113046 /3	S.D.	0.67	0.62	0.73	4.52 0.69	4.46 0.68	4.36	4.32	4.37	4.47 0.70
							0.76	0.74	0.75	



TABLE 4

MEANS AND STANDARD DEVIATIONS FOR SCHOOL ORGANIZATION, SCHEDULING AND ENROLLMENT VARIABLES

Variable Number		Creat Lakes	Farwest	New England	Mideast	Southwest	Rocky Mountains	Plaine	Southeast	Total U.S
		N # 459	N = 314	N = 130	N = 435	N * 182	N = 85	N = 225	N = 363	N = 2193
6	Hean	124.72	130.18	78.67	266.19	55.15	83.25	7/ 70		
	8.0.	209.75	395.74	161.60	455.35	179.88	204.09	76.72 241.14	146.62 238.99	142.50 314.51
7	Mean	30.04	59.62	7.71						
	5 .D.	91.58	119.79	27.27	58.18 146.17	50.29 121.37	109.51 150.10	96.82 212.62	68.04 142.84	56.82 137.53
8		242.22					.,,,,,	111.01	142.04	137.33
8	Mean S.D.	249.18	240.11	306.98	215.35	251.60	140.21	128.09	165.52	213.59
	S.D.	237.33	197.98	228.72	250.14	310.77	172.56	198.32	207.88	235.63
9	Mean	97.96	90.51	169.90	114.32	81.60	49.27	58.02	54.11	
	S.D.	90.68	72.25	128.99	139.96	105.08	75.46	128.23	78.29	99 63 110.22
10	Mean	41.75	41.95	(2.22						110.11
••	S.D.	48.51	119.89	62.37 52.33	52.20	25.51	20.56	29.90	19.79	37.97
	0.0.	40.51	119.09	12.33	79.04	36.24	37.21	108.87	32.96	75.17
11	Mean	60.42	27.72	68.50	85.55	59.10	89.52	94.24	69.06	67.50
	S.D.	110.63	71.88	126.11	131.82	118.60	121.22	209.28	130.83	131.32
12	hean	1.62	16.29	1.03	4.18	5.93	10.20	11.16	2 22	
	S.D.	14.78	179.80	5.70	54.52	33.32	32.03	105.21	3.32 31.98	6.14 81.42
13	Mean	83.11	78.04	75.38	64.05	172.16	05.13			
	S.D.	136.11	312.29	231.70	142.14	326.15	95.13 126.97	92.49 167.98	87.70 146.20	87.86
						520.15	120.77	107.70	146.20	203.63
14	Mean	43.24	75.81	44.68	69.16	45.18	81.21	40.29	17.38	50.11
	s.D.	148.27	340.90	155.90	296.17	247.35	209.20	139.30	75.56	223.64
15	Hean	0.10	0.02	0.05	0.17	0.08	0.11	0.26		
	S.D.	0.29	0.14	0.23	0.38	0.27	0.31	0.44	0.23	0.14
16	Mean	0.74	0.30	0.88	0.51					
	5 .D.	0.44	0.40	0.32	0.50	0.69 0.47	0.41 0.50	0.43	0.42	0.61
17					0.70	••••	0.30	0.30	0.49	5.49
17	Mean	0.14	0.17	0.05	0.28	0.22	0.45	0.30	0.26	0.22
	S.D.	0.35	0.37	0.23	0.45	0.42	0.50	0.46	0.44	0.41
34	Mean	1357.22	1609.39	1383.18	1371.21	1197.77	986.34	883.20	1000 00	
	S.D.	782.56	701.15	686.71	783.34	762.88	559.16	671.31	1028.90 597.63	1266.84 749.29
35	Mean	381.08	477.87	379.54	106 87	366 13	201 24			
	S.D.	219.47	224.70	191.71	396.84 241.10	356.47	321.74	269.15	304.04	369.31
			124.70	171./1	241.10	226.07	185.04	234.00	199.85	228.69



TABLE 5

MEANS AND STANDARD DEVIATIONS FOR USE OF RESOURCES VARIABLES

Variable Number		Great Lakes	Parveat	New England		Southwest	Rocky			
numoe t		Great Lakes	Patreat	New England	Mideast	Southwest	Mountains	Plains	Southeast	Total U.S
		N = 459	N = 314	N = 130	N = 435	N = 182	N = 85	N = 225	N = 363	N = 2193
2	Mean	1.90	1.96	1.78	1.80	1.87	1.98	1.90	1.90	1.88
	S.D.	0.30	0.19	0.42	0.40	0.33	0.15	0.30	0.30	0.32
3	Mean	1.77	1.43	1.63	1.66	1.70	1.81	1.75	1.78	1.68
	S.D.	0.42	0.50	0.49	0.48	0.47	0.40	0.44	0.42	0.47
4	Mean	1.42	1.21	1.40	1.43	1.50	1.55	1.49	1.51	1.42
	S.D.	0.49	0.41	0.49	6.50	0.51	0.50	0.50	9.50	0.50
5	Mean	1.16	1.0)	1.12	1.18	1.15	1.25	1.11	1.11	1.14
	S.D.	0.37	0.26	0.33	0.38	0.36	0.44	0.31	0.32	0.35
19	Mean	1.64	1.75	1.67	1.62	1.64	1.59	1.53	1.64	1.64
	S.D.	0.48	0.44	0.47	0.49	0.48	0.49	0.50	0.48	0.48
20	Mean	1.46	1.45	1.41	1.41	1.56	1.63	1.40	1.58	1.47
	5.D.	0.30	0.50	0.49	0.50	0.50	0.48	0.49	0.49	0.50
21	Mean	0.45	0.56	0.50	0.49	0.43	0.65	0.31	0.99	0.56
	5.D.	0.80	0.87	0.84	0.84	0.78	0.92	0.66	0.95	0.86
22	Mean	0.41	0.50	0.47	0.37	0.51	0.44	0.34	0.45	0.43
	s.D.	0.68	0.71	0.68	0.67	0.73	0.64	0.62	0.70	0.69
23	Mean	1.72	1.77	1.70	1.73	1.75	1.71	1.75	1.77	1.74
	S.D.	0.45	0.42	0.46	0.44	0.43	0.48	0.46	0.42	0.44
24	Mean	1.55	1.71	1.60	1.59	1.57	1.61	1.53	1.58	1.59
	S.D.	0.50	0.46	0.49	0.49	0.50	0.51	0.52	0.49	0.50
43	Mean	2.30	2.55	2.28	2.21	2.24	2.27	2.31	2.29	2.31
	S.D.	0.70	0.62	0.67	0.69	0.78	0.73	0.73	0.74	0.71
44	Mean	1.81	1.83	1.80	1.80	1.64	1.83	1.79	1.72	1.78
	S.D.	0.84	0.76	0.86	0.81	0.78	0.82	0.80	0.89	0.82
45	Mean	2.38	2.38	2.27	2.30	2.35	2.28	2.36	2.20	2.32
	S.D.	0.79	0.82	0.79	0.84	0.85	0.88	0.82	0.90	0.84

TABLE 6

MEANS AND STANDARD DEVIATIONS FOR SCIENCE COURSE VARIABLES

ariable Kumber	-	Great Lakes	Farvest	New England	Mideast	Southwest	Rocky Mountains	Plains	Southeast	Total U.S.
		N = 459	N * 314	N = 130	N = 435	N = 182	N = 85	N = 225	и • 363	N = 2193
46	Mean	24.36	26.91	21.80	25.45	24.91	26.06	23.40	26.68	25.18
	S.D.	6.14	9.00	7.05	6.56	7.44	6.65	7.31	8.29	7.47
84	Mean	0.40	0.36	0.23	0.26	0.37	0.34	0.31	0.31	0.33
_	S.D.	0.49	0.48	0.42	0.44	0.49	0.48	0.46	0.46	0.47
85	Mean	0.20	0.15	0.21	0.22	0.19	0.11	0.17	0.16	0.18
	5.D.	0.40	0.36	0.41	0.42	0.39	0.31	0.38	0.37	0.39
86	Mean	0.05	0.04	0.04	0.12	0.05	0.06	0.11	0.05	0.07
•	5.D.	0.22	0.18	Q.19	0.33	0.23	0.24	0.31	0.22	0.25
87	Maan	0.11	0.11	0.13	0.10	0.08	0.05	0.12	0.07	0.10
	5.D.	0.31	0.31	0.34	0.30	0.27	0.21	0.33	0.25	0.30
88	Mean	0.10	0.10	0.12	0.08	0.20	0.25	0.17	0.15	0.13
	5.D.	0.30	0.30	0.33	0.27	0.40	0.43	0.38	0.36	3ذ.ه



TABLE 7

MEANS AND STANDARD DEVIATIONS FOR TEACHER CHARACTERISTICS
AND BACKGROUND VARIABLES

Varlabi Number		Great Lakes	Farwest	New England	Mideast	Southwest	Rocky Hountains	Plains	Southeast	Total U.S
		N = 459	N * 314	ท ≃ 130	N = 435	N = 182	N = 85	N = 225	N > 363	N = 2193
25	Mean	7.00	5.97	9.50	9.04	6.32	5.30	4.73	5.95	6.88
	S.D.	4.08	2.57	5.12	5.85	3.90	2.98	2.83	3.03	4.34
26	Mean	5.90	5.27	7.44	5.92	4.55	4.45	4.02	3.63	5.37
	S.D.	3.36	2.34	4.09	4.10	3.30	2.13	2.31	2.42	3.41
27	Mean	1.35	1.16	2.44	2.38	1.95	1.08	0.92	2.67	1.81
	S.D.	1.55	1.71	2.09	2.77	2.10	1.18	1.33	1.97	2.09
28	Mean	7.25	6.43	9.88	9.31	6.50	5.54	4.95	6.30	7.18
	S.D.	4.05	2.70	5.10	5.87	3.92	2.59	2.80	3.16	4.36
36	Mean	37 .17	39.27	37.40	37.26	38.11	38.19	35.22	37.04	37.40
	S.D.	10.52	9.97	10.88	11.17	10.83	9.87	10.45	11.38	10.77
37	Mean	1.89	1.86	1.79	1.81	1.76	1.76	1.85	1.54	1.79
	S.D.	0.35	0.35	0.41	0.40	0.43	0.43	0.32	0.50	0.42
38	Mean	2.67	2.63	2.79	2.66	2.51	2,53	2.57	2.46	2.61
	S.D.	0.55	0.53	0.85	0.72	0.56	0.68	0.67	0.71	0.56
39	Mean	1.22	1.11	1.28	1.32	1.26	1.21	1.25	1.27	1.74
	S.D.	0.43	0.32	0.45	0.59	0.44	0.41	0.43	0.45	0.46
42	Mean	11.37	11.85	10.74	11.10	8.88	10.01	10.02	9.21	10.59
	S.D.	9.11	7.39	8.10	8.50	7.13	8.06	7.58	7.38	8.11
74	Mean	36.11	43.80	31.33	31.03	34.18	40.81	32.83	31.76	34.88
	S.D.	28.57	13.57	25.93	24.21	23.15	27.33	26.06	21.40	26.90
75	Mean	32.26	35.41	42.37	34.01	30.84	29.19	30.49	24.35	31.93
	S.D.	27.58	26.34	29.05	26.90	26.09	26.42	23.91	18.38	25.84
76	Mcan	5.48	7.21	5.46	9.03	5.93	9.22	6.16	4.94	6.60
	S.D.	8.86	10.99	10.36	13.17	9.78	10.87	9.52	8.66	10.52
77	Mean	13.66	13.80	14.44	13.89	13.16	12.45	14.36	10.67	13.26
	S.D.	13.10	13.53	10.62	10.99	13.60	12.64	13.50	10.13	13.26
78	Mean	73.86	86.42	79.16	74.07	70.95	79.22	69.48	61.05	73.41
	S.D.	32.40	34.75	33.27	31.56	30.92	31.64	29.97	27.12	73.41 32.24



TABLE 8

MEANS AND STANDARD DEVIATIONS FOR TEACHING PRACTICES,
PREFERENCES AND CONCERNS VARIABLES

/ariable Number		Great Lakes	Farwest	New England	Midenst	Southwest	Rocky Mountains	Flains	Southeast	Total U.S
		N = 459	N = 314	N = 130	N = 435	N = 182	N = 85	N = 225	N = 343	N × 2193
51	Mean	0.64	0.75	0.58	0.57	0.80	0.76	0.87	0.31	0.40
	S.D.	0.89	0.96	0.97	0.82	0.91	0.97	1.10	0.71 0.92	0.49 0.93
54	Mean	0.86	1.05	0.59	0.63	0.97	1.11	0.96	0.99	0.88
	S.D.	0.92	1.02	0.80	0.79	0.92	0.94	0.91	1.03	0.93
55	Mean	0.38	0.32	0.31	0.35	0.37	0.3/	0.97		
-	S.D.	0.60	0.54	0.58	0.54	0.60	0.34	0.36	0.32 0.54	0.35
56	Mean	0.15	0.20	0.10					0.31	0.70
	S.D.	0.47	0.52	0.18 0.45	0.18	0.13	0.22	0.21	0.13	0.17
			0.52	0.45	0.37	0.35	0.64	0.56	0.45	0.50
57	Mean	0.10	0.04	0.08	0.09	0.14	0.08	0.12	0.06	0.09
	S.D.	0.42	0.26	0.35	0.37	0.47	0.28	0.46	0.27	0.37
62	Hean	0.30	0.31	0.33	0.30	0.41	0.51	0.14		
	S.D.	0.74	0.77	0.85	0.72	0.76	1.08	0.36	0.43 0.80	0.15 0.78
63	Mean	0.26	0.12	0.14	0.00					
	S.D.	0.71	0.12	0.18	0.21	0,27	0.14	0.14	0.34	0.22
			0.10	0.71	0.,,	0.68	0,47	0.48	0.79	0.61
64	Mean	4.30	4,45	4.32	4.38	4,21	4.46		4.26	4.13
	S.D.	0.90	0.83	0.90	0.84	0,92	0.72	2.0	0.92	0.88
65	Mean	4.43	4.50	4.41	4.45	4.51	4.55	· .3		
	S.D.	0.83	0.81	0.77	0.82	0,71	0.74	0.80	4.53 0.74	4.4 <i>1</i> 0.79
66	Mean	4.62	4.56	4.65						0,
• •	S.D.	0.64	0.69	0.61	4.66 0.64	4.64 0.68	4.63	4.14	4.73	4.44
				0.01	0.111	0.00	0.58	0.58	0.59	0.64
67	Mean	3.60	3.53	3.75	3.56	1.67	3.51	3.74	3.64	3.61
	S.D.	1.15	1.14	1.09	1.20	1.21	1.20	1.06	1.20	1.15
68	Mean	3.79	3.73	3.86	3.51	3,63	4.10	3.76	3.90	3 17
	S.D.	1.08	1.08	1.06	1.21	1.17	0.96	1.09	1.10	3,74 1,12
69	Mean	4.39	4.50	4.49	4.41	4.40	4.40	4.29	4,42	4.41
	S.D.	0.86	0.74	0.78	0.84	0.78	0.81	0.81	0.80	0.81
70	Mean	4.34	4.45	4.46	4.38	4,43	4.40	4.22	4.52	4,40
	S.D.	0.83	0.74	0.64	0.80	0.75	0.68	0.92	0.74	0.77
71	Mean	4.31	4.43	4.30	4.24	4.29	4.20	4.29	4.27	4.30
	S.D.	0.89	0.83	0.77	0.90	0.93	0.81	0.81	0.95	0.88
72	Mean	3.98	4.13	4,13	4.01	4.04	3.90	3.95	4.25	4.06
	S.D.	0.95	0.95	0.85	0.98	0.99	0.91	0.97	0.90	0.95



Section III

Use of Science Course Improvement Projects

Information concerning this variable was obtained from the Principal's Questionnaire. If enrollment figures were reported for any of the existing NSF-supported Science Course Improvement Projects this variable was assigned a value of two, otherwise it was assigned a value of one. Science Course Improvement Projects are abbreviated as SCIP throughout this report. The mean values for Use of Science Course Improvement Projects are given by region in Table 9. They range from a high of 1.81 for the Farwest to a low of 1.38 for the Southwest. This can be interpreted to mean that 30 to 80 percent of the schools responding were using at least one NSF Science Course Improvement Project (SCIP) depending on the region. Both of the southern regions, Southwest and Southeast, were below 50 percent use.

TABLE 9

MEANS^a AND STANDARD DEVIATIONS FOR USE OF SCIENCE COURSE IMPROVEMENT PROJECTS

	Great Lakes	Farwest	New England	Mideart	Southwest	Rocky Mountains	Plains	Southeast	Total U.S.
Mean	1.76	1.81	1.79	1.57	1.18	1.67	1.59	1.41	1.53
s.o.	0.42	0.39	0.41	0.50	0.49	0.47	0.49	0,49	0.49
4	459	406	130	433	182	85	223	767	2184

The Use of Science Course Improvement Projects resulted in significant ($\alpha \leq 0.001$) positive correlations in at least four of the eight regions with the following variables:

- +Total Student Enrollment
- +Biology, Chemistry and Physics Enrollments
- +Science Course Improvement Project Enrollments
- +Total Number of Teachers
- +Highest Degree Held by Teachers
- +Teacher Ranking of Student Performance in Laboratory as Important Grading Method
- +Teaching Experience Using Biology Science Course Improvement Project Materials
- +Teacher of Twelfth Grade Science Course



The Use of Science Course Improvement Projects resulted in significant ($\alpha \leq 0.001$) negative correlations in at least four of the regions with the following variables:

-General Science Enrollment -Teacher Ranking of Science Demonstration as Important Learning Activity

It can be seen that these relationships may be dependent upon school size and the grade levels included in a school. To investigate the influence of these characteristics on the correlations, four stepwise multiple regression analyses were performed:

- 1) Analysis #1: All variables were allowed to enter in the order which added the most to the prediction equation.
- 2) Analysis #2: The Total Student Enrollment Variable was forced to enter first, thus partialling out its relation to Use of Science Course Improvement Projects and all the other variables. The remaining variables were then allowed to enter stepwise in the order which added the most to the prediction equation.
- 3) Analysis #3: School Type was forced to enter first followed by the stepwise analysis. School Type was composed of three dichotomous variables. They were
 - (a) schools including both junior and senior high school students (Type J-Sr).
 - (b) schools including senior high students only (Type-Sr).
 - (c) schools include junior high school students only (Type-Jr).
- 4) Analysis #4: Both School Type and Total Student Enrollment were forced to enter and then the stepwise analysis followed.

The results of these analyses are given in Table 10 for each region. Total School Enrollment occurred most frequently as a significant contributor to the multiple regression prediction of Use of Science Course Improvement Projects. In the Great Lakes, Southwest, Plains and Southeast the larger schools tend to report use of at least one of the Improvement Projects were so than the smaller schools.

Other variables which contributed to the prediction of Use of Science Course Improvement Projects in two of the eight regions were

1) School type In the Great Lakes and Farwest regions - the high schools reported use more frequently than the junior highs.



SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF

USE OF SCIENCE COURSE IMPROVEMENT PROJECTS

Great La	kes	(N =	459)		<u> </u>		Mideast (N	_ ~	433)				
		riable No. 1 Abbrev.	Multiple R	R Square	RSQ Change	Simple R		٧a	rimble No. d Abbrev.	Multiple R	R Square	RSQ Changa	Simple R
Ali Variables Free	9	Roll Chem	0.29	0.08	0.08	0.29	All Variables Free	No	ne				
Total Enroll, Forced)4	Tot Roll	0.27	0.01	0.07	0.27	Total Enroll. Forced	34	Tot Roll	0.07	0.01	0.01	0.07
School Type Forced	15 16 12 28	Type I Sr Type Sr Type Jr Teach Sci	0.17 0.26 0.27 0.35	0.03 0.07 0.07 0.12	0,03 0,04 0,00 0,0	-0.17 0.26 -0.13 0.27	School Type Forced	15 16 17	Type J-Sr Type Sr Type Jr	0.06 0.15 0.15	0.00 0.01 0.02	0.00 0.02 0.00	0.06 0.10 -0.13
School Type & Total Faroll, Forced	16 17	Type J-Sr Type Se Type Jr Tot Roll	0.17 0.76 0.27 0.13	0.03 0.03 0.03 0.11	0,03 9,04 0,00 0,04	-0.17 0.26 -0.13 0.27	School Typm & Total Enroll, Forced	15 16 17 34	Type Sr	0.06 0.15 0.15 0.16	0.00 0.02 0.02 0.02	0.00 0.02 0.00 0.00	9.06 0.10 -0.13 0.07
Farwest	(N	≃ 309)					Southwest	(N	~ 182)				
		table So. Abbrev.	Multiple R	R Square	RSQ Cliange	Simple R			riable No. d Abbrev.	Multiple K	R Square	µSQ Change	Simple R
All Variables Free	9 10	Rull Chem Roll Phys	0.31 0.39	0.10 0.15	0.10	0.31 0.27	All Variables Free)4	Tot Roll	0.27	0.07	0.07	0.27
Total Sarell. Forced	14	Tot Roll Roll Them	0.14	0.02	0.02	0.14	Total Enroll. Forced	,4	Tot Roll	0.27	0.07	0.07	0.27
School Type Formed	10 15 16 17	Type James J	0.43 0.11 0.33	0.18 0.0. 0.07 0.11	0.09 0.01 0.08 0.02	0.27 -0.11 0.30 -0.30	School Type Forced	15 16 17 34		0.14 0.15 0.15 0.27	0.02 0.02 0.02 0.08	0.02 0.00 0.00 0.05	-0.14 0.11 -0.03 0.27
School Type & Fotal Entoll. Porced	10 15 16 17 34	Roll Phys Type 1-Sr Type to Type tr Type Jr Tot Roll Roll Phys	0.40 0.11 0.30 33 0.44 0.40	0.15 0.01 0.09 0.11 0.11	0.05 0.01 0.08 0.02 0.00 0.05	0.27 -0.14 0.30 -0.30 -0.14 0.27	School Type S Total Enroll. Forced	16 17	Type J-Sr Type Sr Type Jr Tor Roll	0.14 0.15 0.15 0.27	0.02 0.03 0.02 0.08	0.02 0.00 0.00 0.05	-0.14 0.11 -0.03 0.27
New Engla	and	(N · · 1	30)				Rocky Moun	tai	ns (N ^	85)			
		iable No. Abbrev.	Multiple R	R Square	RSQ Change	Simple R			ishle No. LAbbrev.	Multiple P	R Square	issq Change	Simple R
All Variables Free	2 20	Touch Buy Sci Fair	Eq 0.32 0.40	0.10	0.10	0.32	All Variables	6 l 14	Perf Lab Roll Healt	0.17	0.14	0.14 0.11	0.3/-0.35
Total Enroll. Forced	34 2 20 9	Tot Roll Teach Buy Sci Pair Roll Chem	9.03 Eq 0.32 0.40 0.47	0.00 0.10 0.1h 0.22	0.90 0.10 0.05 0.05	-0.03 0.32 -0.25 0.13		24 41 40 20 60	SSF Summer SSF Inserv Sci Fair Fart Cluss	0.56 0.61 0.66 0.70 0.75	0.37 0.43 0.48 0.57	0.07 0.05 0.06 0.05 0.08	0.30 0.18 -0.18 -0.10 -0.20
School Type Forced	17	Type A-Sr Type Sr Type Dr Teach Buy Sci Pair	0.04 0.05 0.07 Eq 0.32 0.41	0.00 0.00 0.01 0.10 0.17	0.00 0.00 0.00 0.10 0.05	0.04 -0.01 -0.05 -0.32 -0.25	Total Enroll. Forced	34 14 61 24 41	Tot Roll Roll Healt) Perf Lab Col Sci Con BSF Summer	0.51 or 0.56 0.61	0.09 0.15 0.26 0.32 0.38	0.00 0.15 0.11 0.06 0.06	0.04 -0.35 0.37 0.30 0.18
School Type & Total Enroll.	16	Type J-Sr Type Sr	0.04	0.00	0.00	0.44 -0.61		40 60 2 0	NSF Inserv Part Class Set Fair	0.65 0.76 0.76	0.44 0.49 0.57	0.06 0.05 0.08	-0.18 -0.20 -0.10
Farced	17 14 2 20 9 11	Type Jr Tot Roll Tensh Buy Sci Fair Roll Chem Roll Earth	0.07 0.08 Eq 0.32 0.41 6.48 0.52	0.01 0.01 0.10 0.17 0.23 0.27	9.00 9.01 0.19 9.06 9.06 9.05	-0.05 -0.03 0.32 -0.25 0.13 -0.16	School Type Forced	15 16 17 14 61 24 41 20 60 40	Type J-Sr Type Sr Type Sr Type Jr Roll Health Perf Lab Col Sci Co SSF Summer Sci Fair Part Class NSF Incolv	0.54	0.00 0.03 0.05 0.20 0.29 0.36 0.40 0.45 0.53 0.58	0.00 0.03 0.01 0.15 0.10 0.07 0.04 0.05 0.07	0.00 0.18 -0.12 -0.35 0.37 0.30 0.18 -0.10 -0.20 -0.18
					3	1	School lype 5 Total Furnil. Forced	15 16 17 33 14 61 24 41 20 60 40	Type J-St Type St Type Jr Tet Ro.1 Poll Health Fit Lob Col Sci Cre NSF Summer Sci Fair Part Class NSF Inserv	0.54	0.00 0.03 0.05 0.05 0.20 0.30 0.37 0.41 0.46 0.53	0.97	0.00 0.18 -0.12 0.04 -0.35 0.37 0.30 0.18 -0.10 -0.20 -0.18



Plains (N \simeq 225)

		lable No. Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables	2ó	Teach Sci	м 0.36	0.13	0.13	0.36
Free	89	NSF	0.48	0.23	0.10	0.36
	49	Sci Demo	0.54	0.29	0.06	-0.29
Total Enroli.	34	Tot Roll	0.26	0.07	0.07	0.26
Forced	89	NSF	0.42	0.17	0.11	0.36
	49	Sci Deno	0.49	0.24	0.06	-0.28
	26	Teach Sci	4 0.54	0.29	0.05	0.36
School Type	15	Type J-Sr	0.12	0.01	0.01	-0.12
Forced	16	Type Sr	0.12	0.02	0.00	0.04
	17	Type Jr	6.13	0.02	0.00	0.06
	26	Teach Sci	M 0.37	0.14	0.12	0.36
	89	NSF	0.48	0.23	0.09	0.36
	49	Sci Demo	0.54	0.29	0.06	-0.28
School Type &	15	Type J-Sr	0.12	0.01	0.01	-0.12
Total Enroll.	16	Type Sr	0.12	0.02	0.00	0.04
Forced	17	Type Jr	0.13	0.02	0.00	0.06
	34	Tot Roll	0.27	0.07	0.06	0.26
	89	NSF	0.42	0.18	0.11	0.36
	49	Sci Demo	0.49	0.24	0.06	-0.28
	26	Teach Sci	M 0.54	0.29	0.05	0.36

Southeast (N \simeq 363)

		iable No. Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables	34	Tot Roll	0.33	0.11	0.11	0.33 0.28
Free	61	Perf Lab	0.40	0.16	0.03	0.20
Total Enrol:	34	Tot Roll	0.33	0.11	0.11	0.33
Forced	61	Perf Lab	0.40	0.16	0.05	0.28
School Type	15	Type J-Sr	0.02	0.00	0.00	-0.02
Forced	16	Type Sr	0.03	0.00	0.00	0.03
	17	Type Jr	0.07	0.00	0.00	0.02
	34	Tot Roll	0.33	0.11	0.11	0.33
	61	Perf Lab	0.40	0.16	0.05	0.28
School Type 6	15	Type J-Sr	0.02	0.00	0.00	-0.02
Total Enroll.	16	Type Sr	0.03	0.00	0.00	0.03
Forced	17	Type Jr	0.07	0.00	0.00	0.02
	34	Tot Roll	0.33	0.11	0.11	0.33
	61	Perf Lab	0.40	0.16	0.05	0.28

All Regions Combined (N \approx 2184)

		iable No. Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	34	Tot Roll	0.23	0.05	0.05	0.23
Total Enroll. Forced	34	Tot Roll	0.23	0.05	0.05	0.23
School Type Forced	15 16 17	Type J-Sr Type Sr Type Jr	0.10 0.17 0.19	0.01 0.04 0.04	0.01 0.03 0.00	-0.10 0.19 -0.12
School Type & Total Enroll. Forced	15 16 17 34	Type J-Sr Type Sr Type Jr Tur Roll	0.10 0.19 0.19 0.26	0.01 0.04 0.04 0.07	0.01 0.03 0.00 0.03	-0.10 0.19 -0.12 0.23



- 2) Chemistry enrollment in the Farwest and New England regions When chemistry enrollments were high the schools had a greater tendency to use improvement projects.
- 3) Participation in NSF Institutes in the Rocky Mountains and Plains regions Teachers who had participated in NSF Institutes reported use of improvement projects more frequently than those not attending.
- 4) Teacher Ranking of Student Performance in Laboratory as Important Grading Method in Rocky Mountains and Southeast regions Those teachers who considered laboratory performance as an important part of grading more frequently reported use of the improvement projects.
- 5) School Sponsored Science Fair Participation for their own students in New England and Rocky Mountains regions The schools sponsoring science fairs were not the schools which reported the use of the science course improvement projects.

There was no predictor or group of predictors of Use of Science Course Improvement Projects that could be applied consistently across all eight regions. Total Student Enrollment and specific course enrollments such as chemistry, physics, and earth science represent a group of variables generally predictive of SCIP usage.

Physical Science

Two variables were used as indicators of the Use of Science Course Improvement Projects in physical science courses. These indicators were:

Teaching Experience Using Physical Science Science Course Improvement Project Materials.

Enrollments in Physical Science Courses Using Science Course Improvement Project Materials,

Information concerning whether or not a teacher had taught physical science course using SCIP materials was obtained from the Science Teacher Questionnaire.

Information concerning physical science enrollments was obtained from the enrollment responses on the Principal's Questionnaire. The enrollment for IPS, ISCS and SSSP were combined to get the enrollment variable for SCIP Physical Science Courses. The mean values for Teaching Experience Using Physical Science Science Course Improvement Project Materials are given in Table 11. They range from a high of 0.20 in the Rocky Mountains region to a low of 0.08 in the Southwest. These values can be interpreted to mean that 8 to 20 percent of the teachers responding have taught physical science using some Science Course Improvement Project. The Rocky Mountains and the Plains regions had the greatest percentage of teachers reporting that they had taught physical science using some SCIP.



TABLE 11

MEANS^a AND STANDARD DEVIATIONS FOR TEACHING EXPERIENCE USING PHYSICAL SCIENCE SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

	Great Lakes	Farvest	New Fngland	Mideant	Southwest	Rocky Mountains	Platne	Southeast	Total U.S.
Mean	0.09	0.09	0.13	0.10	0.08	0.20	0.17	0.10	0.11
S.D.	0.29	0.29	0.34	0.30	0.28	0.40	0.38	0.30	0.31
N	459	314	130	435	182	85	225	363	2193

The mean values for Enrollments in Physical Science Courses Using SCIP Materials are given in Table 12. These values range from a high of 59.46 in the Plains region to a low of 29.10 in the Mideast. The Farwest region also reported relatively low mean enrollments. The relatively large variability as indicated by the size of the standard deviations is due to some schools reporting no Physical Science SCIP Enrollments while others reported very large enrollments. Often a school would have all of a particular grade level, such as the ninth grade, enrolled in such a course. For instance, the Southwest region had three schools reporting 600 or more students taking IPS.

TABLE 12

MEANS AND STANDARD DEVIATIONS FOR ENROLLMENTS IN PHYSICAL SCIENCE COURSES USING SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

	Great Lakes	Farwest	New England	Mideast	Southwest	Kocky Mountains	Plainn	Southeast	Total U.S.
Mean	44.51	32.83	49.25	29.10	44.24	47.13	59.46	43.57	41.52
S.D.	121.03	93.76	101.22	91.32	184.93	103.82	125.17	130.04	119.51
N	459	314	130	435	182	85	225	363	2193

The variable Teaching Experience Using Physical Science SCIP Materials resulted in positive significant correlations ($\alpha \leq 0.001$) in at least four of the regions with the following variables:

- +Enrollments in SCIP Physical Science
- +Enrollments in Chemistry
- +Type of School (Junior High)
- +Physical Science Course Chosen for This Survey
- +Teacher Ranking of Student Performance in Laboratory as Important Grading Method

Significant negative correlations ($\alpha \leq 0.001$) were found for the following variables:

- -Type of School (Senior High)
- -Teacher Ranking of Lecture Discussion as Important Teaching Method
- -Teacher Ranking of Test Scores as Important Grading Method



The Enrollment in Physical Science Courses Using SCIP Materials positively correlated ($\alpha \leq 0.001$) in at least four of the regions with the following variables:

+Enrollments in Physical Science and/or 7th and 8th grade enrollments

+School Type (Junior High)

+Enrollment in ESCP

+Physical Science Course Chosen for This Survey

+Teacher Hours of Earth Science

The negative correlates were school type related. If the school had senior high level students only, the Physical Science SCIP Enrollment was low.

The stepwise regression analyses of Teaching Experience Using Physical Science SCIP Materials partialling out school type and/or Total Enrollment are reported in Table 13 for each region. From these results it appears that the best predictors of whether a teacher has taught physical science using SCIP materials were whether or not the course selected for this survey was a physical science course and in a school type including junior high grade levels. The Rocky Mountains region resulted in the Teacher Ranking of Individual Laboratory Activity Importance as the best predictor after the school type and total enrollment effects were removed. Those teachers who have taught physical science using SCIP materials valued the Individual Laboratory approach to teaching science.

The stepwise regression analyses for Enrollment in Physical Science Courses Using SCIP Materials are reported in Table 14. From the stepwise regression analyses it can be seen that the best predictors of SCIP Physical Science Enrollment are overall physical science enrollment and whether or not the course selected for the survey was a SCIP physical science course.

These relationships are similar to those obtained with the previous variable except for one. The positive relationship of Physical Science SCIP Enrollments and ESCP Enrollments suggest that schools which use SCIP materials in one area tend to do so in other areas of science. In addition, the positive correlation with teacher hours in Earth Science suggest that those teachers of Earth Science who were using the SCIP materials had greater preparation than those teachers not using the materials.

Another variable which contributed significantly to SCIP Physical Science Enrollment In the Rocky Mountain and Plains regions was the ESCP Enrollments. This was true when the effects of Total Enrollment and/or School Type were removed. These results were consistent with the interpretation made earlier. That is the schools where ESCP enrollments were high tend to have high Physical Science SCIP Enrollments.



TABLE 13

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHING EXPERIENCE USING PHYSICAL SCIENCE, SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

Great La	ake	es (N = 45	9)				Mideast	(N ≈ 433)				<u></u>
		ariabla No. id Abbrev.	Multiple R	s R Square	RSQ Change	Simple R		Variable No. and Abbrev.	Multiple R	R Square	RSQ Changi	Simple R
All Variables Free	17		0.38	0.14 0.19	0.14	0.38 0.29	All Variables	s 88 Course Phy S 29 SCIP PS Roll	ct 0.41 0.48	0.17	0.17 0.06	0.41
Total Enroll. Forced	34 88 17	Course Phy Sc	0.01 1 0.18 0.44	0.00 0.14 0.19	0.00 0.14 0.05	-0.01 0.38 0.29	Total Enroll. Forced	. 34 Tot Roll 88 Course Phy S 29 SCIP PS Roll	0.09 c1 0.42 0.48	0.01 0.17 0.23	0.01 0.16 0.06	-0.09 0.41 0.35
School Type Forced	15 16 17 88	Type Sr Type Jr	0.00 0.25 0.29 1 0.44	0.00 0.06 0.08 0.20	0.00 0.06 0.02 0.11	0.00 -0.21 0.29 0.38	School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 88 Course Phy S 29 SCIP PS Roll	0.01 0.23 0.24 0.45 0.50	0.00 0.05 0.06 0.20 0.25	0.00 0.05 0.00 0.15 0.05	0.01 -0.21 0.22 0.41 0.35
School Type & Total Enrull. Forced		Type Sr Type Jr Tot Roll	0.00 0.25 0.29 0.29 1 0.45	0.00 0.06 0.03 0.09 0.29	0.00 0.02 0.00 0.11	0.00 -0.21 0.29 -0.01 0.39	School Type & Total Unitella Forced	S 15 Type J-Sr	0.01 0.23 0.24 0.24	0.00 0.05 0.06 0.06 0.20 0.25	0.00 0.05 0.00 0.00 0.14	0.01 -0.21 0.22 -0.09 0.41 0.35
Farwest	(N	~ 3 09)					Southwest	(N - 182)				
		riable No. d Abbrev.	Multiple R	R Square	RSQ Change	Simple R		Variable No. and Abbiev.	Multiple K	R Square	RSQ Change	Simple R
All Variables Free	88 29	Course Phy Sc SCIP PS Roll	0.41	0.17	0.17	0.41	All Variables Free	17 Type Jr	0.37	0.14	0.14	0.37
Total Enroil. Forced	34 88 29	Tot Roll Course Phy Sc: SCIP PS Roll	0.13 1 0.42 0.48	0.02 0.17 0.2)	0.02 0.16 0.05	-0.13 0.41 0.37	Total Enroll. Forced	34 Tot Roll 17 Type Jr	0.13 0.38	0.02	0.02	-0.13 0.37
School Type Forced	15 16 17	Type J-Sr Type Sr Type Jr	0.04 0.19 0.19	0.00 0.04 0.04	0.00 0.04 0.00	-0.04 -0.17 0.18	School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr	0.09 0.40 0.40	0.01 0.16 0.16	0.01 0.15 0.00	-0.09 -0.31 0.37
School Type & Total Enroil, Forced	88 29 15 16 17 34 88 29	Course Phy Sci SCIP PS Roll Type J-Sr Type Sr Type Jr Tot Roll Course Phy Sci SCIP PS Roll	0.48 0.04 0.19 0.19 0.22	0.18 0.23 0.00 0.04 0.04 0.05 0.19 0.23	0.14 0.05 0.00 0.04 0.00 0.01 0.14	0.41 0.37 -0.04 -0.17 0.18 -0.13 0.41 0.37	School Type & lotal Enrolls Forced		0.09 0.40 0.40 0.41	0.01 0.16 0.16 0.17	0.01 0.15 0.00 0.01	-0.09 -0.31 0.37 -0.13
New Engl							Rocky Mou	ntains (N =	85)			
28=	Var		Multiple R	R Square	RSQ Change	Simple R	no ency Trout		Multiple	R Square	RSQ Change	Simple R
dl Variables Tree	98 15	Course Phy Sci Type J-Sr	0.62	0.38 0.45	0.36	0.62	All Variables Free	88 Course Phy Sci 52 Ind Lab 89 NSF	0.40 0.51 0.58	0.16 0.26 0.33	0.16 0.11 0.07	0.40 0.37 -0.18
otal Enroll. Orced	88	Tot Roll Course Phy Sci Type J-Sr	0.25 0.63 9.68	0.06 0.40 0.46	0.06 0.34 0.06	-0.25 0.62 0.21	Total Enroll. Forced	34 Tot Roll 52 Ind Lab 88 Course Phy Sci	0.09 0.41 0.52	0.01 0.17 0.27	0.01 0.16 0.11	-0.09 0.37 0.40
chool Type Orced	15 16 17 88	Type J-Sr Type Sr Type Jr Course Phy Sci	0.21 9.36 0.39 0.69	0.04 0.13 0.15 0.47	0.04 0.09 0.02 0.32	0.21 -0.36 0.31 0.62		89 MSF 20 Scl Fair 45 Overhead	0,58 0.61 0.65	0.34 0.38 0.43	0.07 0.04 0.05	-0.18 0.14 -0.19
chool Type & otal Enroll. Corced	15 16 17 34 80	Type J-Sr Type Sr Type Jr Tot Roll Course Phy Sci	0. 21 0. 36 0. 39 0. 42	0.04 0.13 0.15 0.18 0.47	0.04 0.09 0.03 0.03 0.30	0.23 -0.36 0.31 -0.25 0.62		15 Type J-Sr 16 Type Sr 17 Type Jr 52 Ind Lab 88 Course Phy Sc1 89 RbF 20 Sct Fair	0.11 0.24 0.38 0.52 0.57 0.61 0.65	0.01 0.06 0.08 0.27 0.13 0.37 0.42	0.01 0.05 0.02 0.19 0.06 0.04 0.05	0.11 -0.24 0.20 0.37 0.40 -0.18 0.14
							Total Enroll. Forced	15 Type J-Sr 16 Type St 17 Type Jr 34 Tet Roll 52 Ind Lab 88 Course Phy Sci 89 NSF 20 Sci Fair	0.11 0.24 0.28 0.28 0.52 0.57 0.61 0.65	0.01 0.06 0.08 0.08 0.27 0.33 0.37	0.07 6.00 0.19 0.06	0.11 -0.24 0.20 -0.09 0.37 0.40 -0.18 0.14



TABLE 13 Continued

Plains (
	Variable No.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	29 SCIP PS R 88 Course Ph	oll 0.57 y Sct 0.64	0.33	0.31 0.09	0.57
Total Enroll. Forced	34 Tot Roll 29 SCIP PS R 88 Course Phy	0.07 oll 0.57 y Sci 0.65	0.01 0.33 0.42	0.01 0.32 0.09	0.07 0.57 0.45
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 29 SCIP PS R 88 COUTSP Ph	0,39 0,39	0.02 0.15 0.15 0.34 0.42	0.02 0.13 0.00 0.19 0.08	-0.13 -0.24 0.38 0.57 0.45
School Type & Total Enroll. Forced	16 Type Sr 17 Type Jr 34 Tot Roll 29 SCIP PS R	0.38 0.39	0.02 0.15 0.15 0.15 0.34	0.02 0.13 0.00 0.00 0.19 0.08	-0.13 -0.24 0.38 0.07 0.57 0.45
Southeas	t (N ≈ 36	3)			
	Variable No. and Abbrev.		R Square	RSQ Charage	Simple R
All Variables Free	88 Course Phy	y Set 0.58	0.33	0.33	0.58
Total Enroll. Forced	34 Tot Roll 88 Course Phy	0.05 y Sci 0.58	0.00	0.00	-0.05 0.58
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 88 Course Phy	0.08 0.26 0.27 y Sci 0.60	0.01 0.07 0.07 0.36	0.01 0.06 0.01 0.29	-0.08 -0.18 0.25 0.58
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 88 Course Phy	0.26 0.27 0.27	0.01 0.07 0.07 0.07 0.36	0.01 0.06 0.01 0.00 0.29	-0.08 -0.18 -0.25 -0.05 -0.58
All Regi	ons Combi	ned (N =	2193)	
	Variable No.	Multiple R		ASQ Change	
All Variables Free	88 Course Phy 29 SCIP PS Ro	; Sci 0.44 511 0.49	0.19 0.24	0.19 0.05	0.44 0.32
Total Enroll. Forced	34 Tot Roll 88 Course Phy 29 SCIP PS Ro		0.01 0.19 0.24	0.01 0.19 0.05	-0.08 0.44 0.32
School Type Forced	15 Type 3-Sr 16 Type Sr 17 Type Jr 88 Course Phy	0.02 0.26 0.27 y Scit 0.47	0.00 0.07 0.08 0.22	0.00 0.07 0.01 0.15	-0.02 -0.22 -0.27 -0.44
School Type 6 Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 88 Course Phy	0.02 0.26 0.27 0.28 y Sci 0.47	0.00 0.07 0.08 0.08 0.22	0.00 0.07 0.01 0.00 0.15	-9.02 -0.22 0.27 -0.08 0.44



TABLE 14

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF ENROLLMENTS IN PHYSICAL SCIENCE COURSES USING SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

Great La	ike	s (N ≈ 459	9)	-			Mideast (N	433)				
		riable No. d Abbrev.	Multiple R	R Square	RSQ Chansa	Simple R			ıfable Na. d Abbiev.	Hultiple R	Я Square	RSQ Change	Simple R
All Variables Free	88			$0.12 \\ 0.16 \\ 0.21$	0.12 0.04 0.05	0.34 0.24 0.28	All Variables Free	. 88	Course Phy Sc	1 0.27	0.07	0.07	0.21
Total Enroll. Forced	. 34 13 88	Roll Phy Sci	0, 21	0.05	0.05	0.21	Total Enroll. Forced	34 88	Tot Roll Course Phy Sc	0.00 1 0.27	0.00	0,00	0.00
Schnol Type Forced	15 16 17 13	Type J-Sr Type Sr Type Jr Roll Phy Sci	0.08 0.18 0.19 0.38	0.17 0.01 0.03 0.03 0.14 0.21	0.05 0.01 0.03 0.00 0.11 0.06	0.24 -0.08 -0.09 0.17 0.04 0.28	School Type Forced	15 16 17 88 30	Type Sr Type Jr Course Phy Sc SCIP ES Roll	0.37	9,00 0.01 0.02 0.09 0.14	0.00 0.01 0.01 0.07 0.05	-0.01 -0.09 0.14 0.27 0.22
School Type & Total Enroll, Forced	16 17	Type Sr	0.08 0.18 0.19 0.30 0.40 0.45	0.01 0.03 0.03 0.09 0.16 0.21	0.01 0.03 0.00 9.06 0.07 0.05	-0.08 -0.09 -0.17 -0.21 -0.36 -0.28	School Type & Total Enroll. Forced	15 16 17 34 88 30	Type Sr Type Jr For Roll Course Phy Sc	0.01 0.11 0.14 0.15 0.30 0.17	0.00 0.01 0.02 0.02 0.03 0.14	0.00 0.01 0.01 0.00 0.07 0.05	-0.01 -0.09 0.14 0.00 0.27 0.22
Farwest	(N	~ 309)					Southwest	()	182)				
		riable No. 1 Abbrev.	Multiple R	ų S q uate	RSQ Change	himple R			rtable No. d Abbrov.	Multiple H	R Square	KSQ change	Simple H
All Variables Free	88	Course Phy Sci	0.34	0.12	0.12	0.34	All Vistlables Free	61 61	• • •	0.24 0.16	0.06 0.11	0.06	0.24
Total Enroll. Forced	34 88	Tot Roll Course Phy Sci	0.14 0.36	0.02	0.02	-0.14 0.34	Total Enroll. Forced	65	Tat Roll Admin Supp Perf Lab	0.14 0.26 0.34	0.02 0.07 0.12	0.02 0.05 0.05	0.14 -0.24 0.23
School Type Forced	15 16 17 88	Type J-Sr Type Sr Type Jr Course Phy Sci	0.05 0.27 0.29 0.40	0.00 0.07 0.08 0.16	0.00 0.07 0.01 0.08	-0.05 -0.24 0.29 0.34	School Type Forced	15 16 17 65	lype J-Sr Type Sr Type Jr Admin Supp	0.07 0.08 0.09 0.27	0.00 0.01 0.01 0.07	0.00 0.00 0.00 0.06	-0.07 -0.01 0.07 -0.24
School Type & Total Enroll. Forced	15 16 17 34 88	Type J-Sr Type Sr Type Jr Tot Roll Course Phy Sci	0.05 0.27 0.29 0.30 0.41	0.00 0.07 0.08 0.09 0.17	0.00 0.07 0.01 0.01 0.08	-0.05 -0.24 0.29 -0.14 0.34	School Type 6 Total Enroll. Forced	61 15 16 17 34 65 61	Type Sr Type Jr	0.36 0.07 0.08 0.09 0.16 0.28 0.36	0.13 0.00 0.01 0.01 0.03 0.08 0.13	0.06 0.00 0.00 0.00 0.02 0.06 0.05	0.23 -0.07 -0.01 0.07 0.14 -0.24 0.23
New Engl	anc	l (N ≃ 130					Rocky Mour	ıta	ins (N ≃	85)			
		Lable No	tultiple R	R Square	RSQ Change	Simple R			iable No. Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	38 33	Course Phy Sci SCIP Phys Roll		0.07 0.15	0.07	0.27	All Variables Free	13 30	Roll Phy Sci SCIP ES Roll	0.70 0.76	0.49	0.49 0.08	0.70 0.48
Total Enroll. Forced	88	Tot Roll Course Phy Sci SCIP Phys Roll		0.00 0.08 0.15	0.00 0.08 0.07	0.01 0.27 0.24	Total Enroll. Forced	34 13 30	Tot Roll Roll Phy Sct SCIP ES Roll	0.02 0.70 0.76	0.00 0.49 0.57	0.00 0.49 0.08	-0.02 0.70 0.48
School Type Forced	15 16 17 33 88	Type J-Sr Type Sr Type Jr SCIP Phys Roll Course Phy Sci	0.07 0.19 0.21 0.35 0.43	0.01 0.03 0.05 0.12 0.18	0.01 0.03 0.01 0.07 0.06	0.07 -0.18 0.19 0.24 0.27	School Type Forced	16 17 13 30 57	Type J-Sr Type Sr Type Jr Roll Phy Sci SCIP FS Roll Auto Tut	0.06 0.34 0.37 0.70 0.76 0.79	0.00 0.11 0.14 0.49 0.57 0.62	0.00 0.11 0.02 0.35 0.09 0.05	-0.06 -0.30 0.37 0.70 0.48 -0.03
School Type & Total Enroll. Forced	15 16 17 34 33 88	Type J-Sr Type Sr Type Jr Tot Roll SCIP Phys Roll Course Phy Sci		0.01 0.03 0.05 0.05 0.12 0.18	0.01 0.03 2.01 0.00 0.07 0.06	0.07 -0.18 0.19 0.01 0.24 0.27	School Type & lotal Enroll. Forced	34 13	Inservice Type J-Sr Type Sr Type Jr Tot Rail Roll Phy Sei SCIP ES Roll Auto Tut factivice	0.82 0.06 0.34 0.37 0.38 0.70 0.76 0.79 0.82	0.67 0.00 0.11 0.14 0.14 0.49 0.57 0.62 0.67	0.34	0.72 -0.06 -0.30 0.37 -0.02 0.70 0.48 -0.03 0.22



Plains (N \approx 225)

		iable No. Abbrev.	Holtiple R	R Square	RSQ Change	Simple R
All Variables	30	SCIP ES ROLL	0.54	0.29	0.29	0.54
Free	17	Type Jr	0.63	0.40	0.11	0.51
	26	Teach Sel M	0.67	0.45	0.05	0.37
	35	CAE	0.71	0.50	0.05	0.13
Total Enroll.	34	Tot Roll	0.12	0.01	0.01	0.12
Forced	30	SCIP ES Roll	0.54	0.29	0.28	0.54
	28	Teach Set	0.64	0.41	0.12	0.32
	17	Type Jr	0.69	0.41	0.07	0.51
School Type	15	Type J-Sr	0.14	0.02	0.02	-0.14
Forced	16	Type Sr	0.51	0.26	0.24	-0.35
	17	Type Jr	0.52	0.27	0.01	0.51
	30	SCIP ES ROLL	0.64	0.40	0.13	0.54
	26	Teach Sct M	0.68	0.46	0.06	0.37
School Type &	15	Type J-Sr	0.14	0.02	0.02	-0.14
Total Enroll.	16	Type St	0.51	0.26	0.24	-0.35
Forced	17	Type ir	0.52	0.27	0.01	0.51
	34	Tot Roll	0.53	0.28	0.01	0.12
	26	Teach Sct H	0.64	0.42	0.13	0.37
	30	SCIP FS Roll	0.71	0.50	0.09	0.54

Southeast ($N \approx 363$)

		table No.	Multiple	R	RSQ	Simple
	and	Abbrev.	ĸ	Square	Change	R
All Variables	48	Lect Disc	0.29	0.08	0.08	-0.29
Free	88	Course Phy Sc	0.30	0.13	0.05	0.28
Total Enroll.	34	Tot Roll	0.11	0.01	0.01	0.11
Forced	48	Lect Disc	0.31	0.09	0.08	-0.29
	88	Course Phy Sc	0.38	0.14	0.05	0.28
School Type	15	Type J-Sr	o. 0 6	0.00	0.00	-0.06
Forced	16	Type Sr	0.21	0.04	0.04	-0.15
	17	Type Jr	0.24	0.06	0.01	0.24
	52	Ind Lab	0.35	0.12	0.06	0.23
School Type &	15	Type J-Sr	0.06	0.00	0.00	-0.06
Total Enroll.	16	Type Sr	0.21	0.04	0.04	-0.15
Forced	17	Type Jr	0.24	0.06	0.01	0.24
•	34	Tot Roll	0.28	0.08	0.03	0.11
	4.8	Lect Disc	0.37	0.14	0.06	0.,79

All Regions Combined (N \approx 2193)

		iable Bo. Abbrev.	Multiple R	R Square	KSQ Clange	Simple R
All Variables Free	88	Course Phy Sa	0.24	0.06	0.06	0.24
Total Enroll.	3.5	lot Roll	0.06	0.00	0.00	0.06
Forced	88	tourse Phy Sci	0.26	0.07	0.05	04
School Type	15	Type J-Sr	0.05	0.00	0.690	-0.05
Forced	16	• •	0.20	0.04	0.04	-0.14
	17	Type Jr	0.22	0.05	0.01	0.22
School Type &	15	Type J-br	0.05	0.00	0,00	-0.05
lotal Entell.	16	Type Si	0.20	0.04	0.04	-0.14
Forced	17	Type Jr	0.22	0.05	0.01	0
	34	lot Roll	0.24	0.06	0.01	0.06



Earth Science

Two variables were used as indicators of the use of Science Course Improvement Projects in earth science courses. These variables were:

Teaching Experience Using Earth Science Science Course Improvement Project Materials.

Enrollments in Earth Science Courses Using Science Course Improvement Project Materials.

The mean values for these variables are reported in Tables 15 and 16. The mean values in Table 15 indicate that from 2 percent in the Southwest to 9 percent in the Rocky Mountains of the responding teachers had taught earth science using SCIP materials. The mean enrollment in earth science courses using SCIP materials ranged from a low of 8.86 students per school in the Farwest to a high of 38.06 students per school in the Plains region.

TABLE 15

MEANS^a AND STANDARD DEVIATIONS FOR TEACHING EXPERIENCE USING EARTH SCIENCE SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

	Great Lakes	Farvest	New England	Mideast	Southwest	Rocky Mountains	Plains	Southcast	Total U.S.
Mean	0.03	0.03	0.04	0.04	0.02	0,09	0.05	0.04	0.05
S.D.	0.17	0.18	0.19	0.19	0.15	0.29	0.23	0.21	0.19
N	459	314	130	435	182	85	225	361	2193

TABLE 16

MEANS AND STANDARD DEVIATIONS FOR ENROLLMENTS IN EARTH SCIENCE COURSES USING SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

	Great Lakes	Farwest	New England	Miduast	Southwest	Rocky Mountains	Plains	Southeast	Total U.S.
Mean	18.36	8.86	20.07	19.85	14.65	28.58	38.06	13.42	18.69
S.D.	60.04	33.76	69.61	77.54	62.67	71.17	105.96	64.70	59.33
N	459	314	130	435	182	85	225	363	2193

These two variables correlated positively at the ($\alpha \leq 0.001$) level with each other in at least four of the eight regions. In addition, the variable, Teaching Experience Using Earth Science SCIP Materials, correlated positively ($\alpha < 0.001$) in at least four of the eight regions with the following:



⁺Teacher hours of earth science credits

⁺Earth Science Course Chosen for This Survey

The variable, Enrollments in Earth Science Courses Using SCIP Materials correlated positively ($\alpha \leq 0.001$) in at least four of the eight regions with the following:

+General enrollments in 9th grade and in earth science

+Use of SCIP

+Enrollments in SCIP Physical Science and SCIP Chemistry

+Number of Teachers

+Earth Science Course Chosen for This Survey

The regression analyses in Table 17 indicated that the best predictor for whether or not a teacher has taught earth science using SCIP materials is the number of earth science credits the teacher had. This was a significant factor in all regions except the Farwest and the Plains.

The enrollments in SCIP earth science courses were consistently best predicted by total physical science enrollments as reported in Table 18. This is as expected from the previous variables. All regions except the Farwest resulted in the enrollments in other SCIP materials as significant predictors. In some regions it was physics, some biology, some physical science, and some chemistry. This would indicate that schools using SCIP in earth science tend to use SCIP in some other area of science also.

Biology

Two variables were used as indicators of the use of SCIP in biology courses. These variables were:

Teaching Experience Using Biology Science Course Improvement Project Materials.

Enrollments in Biology Courses Using Science Course Improvement Project Materials.

The biology course SCIP materials included BSCS: Blue, Green, Yellow, P & P and II.

The mean values for these variables are reported in Tables 19 and 20. These means indicate a range of 13 to 27 percent of the teachers have taught biology using SCIP materials. The percentages were relatively consistent from region to region. The mean Enrollments in Biological Science Courses Using SCIP Materials ranged rom a low of 69.81 per school in the Southwest to a high of 162.49 in the Farwest. The variations in these enrollments were related to differences in Total Student Enrollments in most cases.

These two variables correlated positively at the ($\alpha \le 0.001$) level with each other in at least four of the eight regions. In addition, the variable, Teaching Experience Using Biology Science Course Improvement Project Materials, correlated positively ($\alpha \le 0.001$) in at least four of the eight regions with the following variables:

+Use of SCIP

+Teacher's college credits in biological sciences

+Biology Course Chosen for This Survey

+Tenth grade level course chosen for this survey



TABLE 17

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHING EXPERIENCE USING EARTH SCIENCE, SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

Great L	ake	es (N = 4	59)		<u> </u>		Mideast	(N	≈ 433)				
		nrieble No. nd Abbrev.	Hultipl∈ R	e R Square	RSQ Change	Simple R			ariable No. nd Abbrev.	Multiple R	R Square	RSQ Change	Simple K
All Vartable Free	: 80 70	Course Larth Hrs Earth	0.42	0.18 0.24	0.1H 0.06	0.42	All Variables	76	6 Hrs Earth	0.37	0.13	0.13	0.37
fotal Enroll Forced	. 34 86 76 30	Course Carth Hrs Earth	0.49	0.00 0.18 0.24 0.29	0.00 0.18 0.06 0.05	-0.02 0.42 0.39 0.31	Total Enroll.	34 76		0.00 0.37	0.00	9.00 0.13	0.00
School Type Forced	15 16 17 86	Type J-Sr Type Sr Type Jr	0.06 0.17 0.19	0.00 0.03 0.03 0.21	0.00 0.02 0.01 0.17	-0.06 -0.10 0.11 0.42	School Type Forced	15 16 17 76	Type Sr Type Jr Hrs Earth	0.09 0.10 0.11 0.38	0.01 0.01 0.01 0.14	0.01 0.00 0.00 0.13	-0.09 0.01 0.03 0.37
School Type & Total Enroll. Forced	16 17	Type J-Sr Type Sr Type Jr Tot Roll Course Earth Hrs Earth	0.52 0.06 0.17 0.19 0.19 0.46 0.52 0.57	0.27 0.00 0.03 0.03 0.03 0.21 0.27 0.32	0.06 0.00 0.02 0.01 0.00 0.17 0.06 0.05	0.39 -0.06 -0.10 0.11 -0.02 0.42 0.39 0.31	School Type & Total introll. Forced	15 16 17 34 76	Type Sr Type Jr Tot Roll	0.09 0.10 0.11 0.11 0.38	0.01 9.01 0.01 0.01 0.14	0.01 0.00 0.00 0.00 0.13	-0.09 0.01 0.03 0.00 0.37
Farwest	(N	~ 309)			.		Southwest	: (N - 182)				
		riable No. I Abbrev.	Multiple R	R Square	RS() Change	Simple R		Va	rtuble No. d Abbrev.	Moltiple R	R Squere	RSQ Change	Simple R
All Variables Pree	30	SCIP ES Roll	0.25	6.06	0.06	0.25	All Variables Free	76	His Eirth	0.23	0.05	0.05	0.23
Total Enroll. Forced	34 30	Tot Roll SCIP ES Roll	0.03 0.25	0.00 0.06	0.00	-0.03 0.25	Total Enroll. Forced	34 76	Tet Roll Hrs Earth	0.16 0.28	0.03 0.08	0.03	0.16 0.23
School Type Forced	15 16 17 30	Type J-Sr Type Sr Type Jr SCIP ES Roll	0.03 0.15 0.17 0.30	0.00 0.02 0.03 0.09	0.00 0.02 0.01 0.06	-0.03 -0.14 0.11 0.25	School Type Forced	15 16 17 41	Type J-Sr Type Sr Type Jr NSF Summer	0.04 0.10 0.11 0.25	0.00 0.01 0.01 0.06	0.00 0.01 0.00 0.05	-0.04 -0.06 0.10 0.21
School Type & Total Enroll. Forced		Type J-Sr Type Sr Type Jr Tot Roll SCIP ES Roll	0.03 0.15 0.17 0.17 0.30	0.00 0.02 0.03 0.03 0.09	0.00 0.02 0.01 0.00 0.06	-0.03 -0.14 0.11 -0.03 0.25	School Type & Total Enroll. Forced	15 16 17 34 41	Type J-Sr Type Sr Type Jr Tot Roll NSF Summer	0.04 0.10 0.11 0.20 0.30	0.00 0.01 0.01 0.04 0.09	0.00 0.01 0.00 0.03 0.05	-0.04 -0.06 0.10 0.16 0.21
New Engl	and	(N ≃ 130	<u>)</u>				Rocky Mou	nt:	ains (N =	85			
		lable No. Abbrev.	Multiple R	K Squ≢re	RSQ Change	Simple R	,	Varl	lable No. Abbrev.	Multiple	R Square (RSQ Change	Simple R
All Variables Free		Hrs Earth Roll Health	0.42 0.51	0.18	0.18	0.42 0.29	Free	56	Bra Earth Prog Inst Course Earth	0.53 0.63 0.68	0.29 0.39 0.46	0.29 0.11 0.07	0.53 0.39 0.43
Total Enroll.	76 14	Hrs Earth Roll Health	0.10 0.43 0.53	0.01 0.19 0.28	0.18	0.29		34 76 56		0.02 0.53 0.63	0.00 0.29 0.40	0.00 0.29 0.11	-0.02 0.53 0.39
School Type Forced	16 17 76	Type J-Sr Type Sr Type Jr Hrs Earth Roll Health	0.13 0.18 0.19 0.43 0.53	0.02 0.03 0.04 0.19 0.28	0.02 0.02 0.00 0.15 0.09	0.13 -0.18 0.13 0.42 0.79	School Type Forced	15 16 17	Type J-Sr Type Sr Type Jr Hrs Earth	0.69 0.1t 0.33 0.35 0.56	0.47 0.01 0.11 0.12 0.31		0.43 -0.11 -0.27 0.28 0.53
orced	16 17 34 76	Type J-Sr Type Sr Type Jr Tot Roll drs Earth Roll Health	0.13 0.18 0.19 0.20 0.44 0.54	0.03 0.04 0.04 0.19	0.00	0.42	School Type & Total Enroll- Forced	56 36 15 16 17 17 16 16 16	Prog Inst Course Earth Type J-Sr Type Sr Type Jr Tot Roll Hrs Earth Prog Inst Course Earth	0.66 0.71 0.11 0.33 2.35 0.35 0.35 0.66	0.43 0.50 0.01 0.11 0.12 0.13 0.32 0.43	0.12 0.07 0.01 - 0.10 - 0.01 0.01 - 0.19 0.12	0, 39 0, 43 0, 11 0, 27 0, 28 0, 02 0, 53 0, 39 0, 43



TABLE 17 Continued

TABLE 1	7 Continu	ıed			
Plains	(N = 225)	C	_		_
	Variable No and Abbrev.	. Multiple R	R Square	RSQ Change	Simpl R
All Variables Free	86 Course	Earth 0.37	i). 13	0.13	0.37
Total Enroll. Forced	34 Tot Rol 86 Course		0.00	0.00	-0.01 0.37
School Type Forced	15 Type J-: 16 Type Sr	Sr 0.05 0.27	0.00	0.00 0.07	-0.05 -0.20
	17 Type Jr	0.28	0.08	0.00	0.23
	86 Course		0.16	0.08	0.37
	83 SCIP PS		0.20	0.04	-0.11
	30 SCIP ES	koll 0.50	0.25	0.05	0.28
School Type &			0.00	0.00	-0.05
Total Enroll. Forced	16 Type Sr 17 Type Jr	0.27	0.07	0.07	-0.20
rorced	34 Tot kull	0.28 0.28	0.08 0.08	0.00 0.00	-0.23
	86 Course b		0.16	0.08	0.37
	83 SCIP PS		0.20	0.04	-0.11
	30 SCIP ES	ко11 0.50	0.25	0.05	0.28
Southeas	$t (N \simeq 3)$	63)			
	Variable No.	Multiple	R	RSQ	Simple
	and Abbrev.	R	Square	Change	ĸ
All Variables	86 Course 1	arth 0.18	0.15	0.15	0.38
Free	76 Hrs Eart	tı 0.44	0.19	0.05	0.11
Total Enroll.	34 Tot Roll		0.00	0.00	-0.01
Forced	86 Course E		0.15	0.15	0.38
	30 SCIP ES	Rol1 0.44	0.20	0.05	0.25
School Type	15 Type J-S		0.00	0.00	-0.02
Forced	16 Type Sr	0.16	0.03	0.03	-0.13
	17 Type Jr 86 Course E		0.03 0.15	0.00	0.15
	80 Course E	aren 0.39	0.13	0.13	0.30
School Type &	15 Type J-S		0.00	0.00	-0.02
Total Enroll.	16 Type Sr	0.16	0.03	0.03	-0.13
Forced	17 Type Jr 34 Tot Roll	0.16 0.16	0.03 0.03	0.00 0.00	0.15
	86 Course E		0.15	0.13	0.38
	30 SCIP ES		0.20	0.05	0.25
All Regio	ons Combi	ned (N ≈	2193)		
	Vertable No.	Multiple	R R	1000	
	and Abbrev.	R	Square	RSQ Change	Simple R
All Variables Free	T4 Hrs Earth	0.33	0.11	0.11	0.33
Total Enroll.	34 Tot Roll	0.02	0.00	0.00	-0.02
Forced	76 Hrs Earth		0.11	0.11	0.33
School Type	15 Type J-Sr	0.04	U. 00	9.00	-0.04
Forced	16 Type Sr	0.16	0.03	0.02	-0.12
	17 Type Jr	0.16	0.03	0.00	0.14
	76 Hrs Earth	0.35	0.12	0.10	1), 13
School Type &	15 Type J-Se		0.00	0.00	-0.04
Total Enroll. Forced	16 Type Sr 17 Type Jr	0.16 0.16	0.03	0.02	-0.1.
	34 Tot Roll	0.16	0.03 0.03	0.00	0.14
	76 Hrs Earth		0.12	0.10	0.33



SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF ENROLLMENTS IN EARTH SCIENCE COURSES USING SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

Great La	akes (N ≃ 4	59)				Mideast	(N :	× 433)	-			
	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R			ariable No. ad Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	11 Roll Earth 33 SCIP Phys R	0.43 oll 0.52	0.18 0.27	0.18	0.43 0.35	All Variable Free	s ll	Roll Earth	0.30	0.09	0.09	0.30
Total Enroll. Forced	34 Tot Roll 11 Roll Earth 33 SCIP Phys Ro	0.25 0.46 oll 0.52	0.06 0.21 0.27	0.06 0.15 0.06	0.25 0.43 0.35	Total Enroll Forced	. 34 11		0.10 0.31	0.01	0.01	0.10 0.30
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 11 Roll Earth 33 SCIP Phys Ro	0.09 0.10 0.12 0.43 0.11 0.52	0.01 0.01 0.01 0.19 0.27	0.01 0.00 0.00 0.17 0.08	-0.09 0.02 0.07 0.43 0.35	School Type Forced	15 16 17 11 29	Type Sr Type Jr Roll Earth	0.04 0.04 0.08 0.32 0.38	0.00 0.00 0.01 0.10 0.15	0.00 0.00 0.00 0.10 0.05	-0.04 0.01 0.00 0.30 0.22
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 11 Roll Earth 33 SCIP Phys 5.	0.09 0.10 0.12 0.27 0.46 011 0.52	0.01 0.01 0.01 0.08 0.21 0.27	0.01 0.00 0.00 0.06 0.13 0.06	-0.09 0.02 0.07 0.25 0.43 0.35	School Type (Total Enroll, Forced		Type Sr Type Jr Tot Roll Roll Earth	0.04 0.04 0.08 0.13 0.32 0.39	0.00 0.00 0.01 0.02 0.10 0.15	0.00 0.00 0.00 0.01 0.09 0.05	0.04 0.01 0.00 0.10 0.30 0.22
Farwest	(N ≈ 309)		·			Southwest	(N	1 = 182)				
	Variabla No. and Abbrev.	Multiple R	k Square	RSQ Change	Simple R		۷.1	rtable No. d Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Varlables Free	11 Roll Earth	0.45	0.21	0.21	0.45	All Variables Free	32 11	5CTP Chem Rot. Roll Larth	0.31 0.40	0,09 0.16	0.07	0.11
Total Enroll. Forced	34 Tot Roll 11 Roll Earth	0.03 0.46	0.00	0.00	0.03	Total Enroll. Forced	34 32 11	Tot Roll SCIP Chem Roll Roll Earth	0.15 0.31 0.40	0.02 0.10 0.10	0.02 0.08 0.07	0.15 0.31 0.26
School Type Forced School Type &	15 Type J-Sr 16 Type Sr 17 Type Jr 11 Roll Earth 15 Type J-Sr	0.02 0.02 0.04 0.47	0.00 0.00 0.00 0.22	0.00 0.00 0.00 0.22	0.02 -0.01 0.02 0.45	School Type Forced	15 16 17 32	Type J-Sr Type Sr Type J: SCIP Chem Roll Roll Earth	0.06 0.06 0.07 0.32 0.41	0.00 0.00 0.01 0.10 0.17	0.00 0.00 0.00 0.10 0.07	-0.06 0.00 0.04 0.31 0.26
Total Enroll.		0.02 0.04 0.05 0.47	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.22	-0.01 0.02 0.03 0.45	School Type & Total Enroll. Forced		Type J-Sr Type Sr Type Jr Tot Roll SCIP Chem Roll Roll Earth	0.06 0.06 0.07 0.16	0.00 0.00 0.01 0.03 0.11 0.17	0.00 0.00 0.00 0.02 0.08 0.06	-0.06 0.00 0.04 0.15 0.31 0.26
New Engla	and $(N \approx 13)$	0)				Rocky Mour	nta	ins (N = 8	35)			
	Variable No. and Abbrev.	Multiple R	R Square	RSQ Changer	Simple R			lable No.) Abbrev.	tultiple R	R Square	RSQ Change	Simple R
all Varlables Tree	31 SCIP Bio Roll 40 NSF Inserv	0.50 0.56	0.25	0.25	0.50	All Variables Free	57	SCIP PS Roll Auto Tut Interest	0.48 0.56 0.60	0.23 0.31 0.36	0.23 0.08 0.05	0.48 0.27 -0.11
orced	34 Tot Roll 31 SCIP Bio Roll 40 NSF Inserv 35 CAE	0.57	0.11 0.27 0.33 0.39	0.11 0.16 0.06 0.06	0.34 0.50 0.44 0.25	Total Enroll. Forced	29 57	Tot Roll SCIP PS Roll Auto Tut Interest	0.00 0.48 0.56 0.60	0.00 0.23 0.31 0.36	0.00 0.23 0.08 0.05	0.00 0.48 0.27
orced	15 Type J-Sr 16 Type Sr 17 Type Jr 31 SCIP Blo Roll 40 NSF Inserv	0.04 0.05 0.21 0.55 0.67	0.00 0.00 0.04 0.30 0.38		0.04 -0.04 -0.06 0.50 0.44	School Type Forced	16 17 29	Type J-Sr Type Sr Type Jr SCIP PS Roll Auto Tut	0.11 0.26 0.28 0.49 0.57	0.01 0.07 0.08 0.24 0.33	0.05 - 0.01 0.17	0.11 -0.19 0.28 0.48 0.27
otal Enroll. orced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 31 SCIP Bio Roll 40 NSF Inserv	0.04 0.05 0.21 0.42 0.58 0.63	0.00 0.00 0.04 0.17 0.33 0.40		0.04 -0.04 -0.06 0.34 0.50 0.44	Total Enroll. Forced	63 15 16 17 34 29 57 63	Interest lype J-Sr Type Sr Type Jr Tot Roll SGIP PS Roll Auto Tut Interest Roll Phy Sci Inservice	0.61 0.11 0.26 0.28 0.28 0.49 0.57 0.62 0.65	0.38 0.01 0.07 0.08 0.08 0.24 0.33 0.38 0.43	0.05 - 0.01 - 0.05 - 0.01 0.00 0.16 0.09 0.05 - 0.04	0.27 0.11 0.11 0.19 0.28 0.00 0.48 0.27 0.11 0.29 0.01



Plains (N \approx 225)

		riable No. i Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables	29	SCIP PS ROLL	0.54	0.29	0.29	0.54
Frec	76	Hrs Earth	0.59	0.34	0.05	0.36
Total Enroll.	34	Tot Roll	0.17	0.03	0.03	0.17
Forced	29	SCIP PS Roll	0.55	0.30	0.27	0.54
	09	Roll Chem	0.60	0.36	0.06	-0.13
School Type	15	Type J-Sr	0.09	0.01	0.01	-0.09
Forced	16		0.38	0.15	0.14	-0.27
	17	Type Jr	0.39	0.15	0.00	0.38
	29	SCIP PS Roll	0.55	0.31	0.16	0.54
School Type &	15	Type J-Sr	0.09	0.01	0.01	-0.09
Total Enroll.	16	Type Sr	0.38	0.15	0.14	-0.27
Forced	17	Type Jr	0.39	0.15	0.00	0.38
	34	Tot Roll	0.43	0.18	0.03	0.17
	29	SCIP PS Roll	0.57	0.32	0.14	0.54
	09_	Roll Chem	0.61	0.37	0.05	-0.13

Southeast (N \approx 363)

		iable No. I Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	11 31	Roll Earth SCIP Bio Roll	0.28 0.36	0.08	0.08	0.28, 0.24
Total Enroll. Forced	34 11	Tot Roll Roll Earth	0.22	0.05	0.05	0.22
School Type Forced	15 16 17 11 31	Type J~Sr Type Sr Type Jr Roll Earth SCIP Bio Roll	0.01 0.04 0.09 0.29 0.37	0.00 0.00 0.01 0.08 0.14	0.00 0.00 0.01 0.08 0.05	-0.01 -0.03 0.08 0.28 0.24
School Type & Total Enroll. Forced	15 16 17 34	Type J-Sr Type Sr Type Jr Tot Roll Roll Earth	0.01 0.04 0.09 0.25 0.33	0.00 0.00 0.01 0.06 0.11	0.00 0.00 0.01 0.05 0.05	-0.01 -0.03 0.08 0.22 0.28

All Regions Combined (N \approx 2193)

		riable No. i Abbrev.	Multiple R	R Square	KSQ Change	Simple R
All Variables Free	11	Roll Earth	0.33	0.11	0.11	0.33
Total Forcell. Forced	34 11	Tot Roll Roll Earth	0.13 0.34	0.02	0.02	0.13
School Type Forced	15 16 17 11	Type J-Sr Type Sr Type Jr Roll Earth	0.04 0.11 0.11 0.33	0.00 0.01 0.01 0.11	0.00 0.01 0.00 0.10	-0.04 -0.07 0.11 0.33
School Type & Total Enroil. Forced	15 16 17 34 11	Type A-Sr Type Sr Type Jr Tot Roll Roll Earth	0.04 0.11 0.11 0.19 0.15	0.09 0.01 0.01 0.04 0.12	0.00 0.01 0.00 0.02 0.08	-0.04 -0.07 0.11 0.13 0.33



TABLE 19

MEANS^a AND STANDARD DEVIATIONS FOR TEACHING EXPERIENCE USING BIOLOGY SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

eat Lakes	Farwest	New England	Mideast	Southwest	Rocky Mountains	Plains	Southenst	Total U.S.
0.23 0.42 459	0.27 0.44 314	0.23 0.42 130	0.14 0.35 435	0.19 0.39 182	0.14 0.35 85	0.19 0.39 225	0.13 0.34 363	0.19 0.39 2193
	0.42	0.42 0.44 459 314	0.42 0.44 0.42 459 314 130	0.42 0.44 0.42 0.35 459 314 130 435	0.23 0.27 0.23 0.14 0.19 0.42 0.42 0.35 0.39 459 314 130 435 182	0.23 0.27 0.23 0.14 0.19 0.14 0.42 0.42 0.35 0.39 0.35 459 314 130 435 182 85	0.23 0.27 0.23 0.14 0.19 0.14 0.19 0.42 0.44 0.42 0.35 0.39 0.35 0.39 459 314 130 435 182 85 225	0.23 0.27 0.23 0.14 0.19 0.14 0.19 0.13 0.42 0.44 0.42 0.35 0.39 0.35 0.39 0.34 459 314 130 435 182 85 225 363

TABLE 20

MEANS AND STANDARD DEVIATIONS FOR ENROLLMENTS IN BIOLOGICAL SCIENCE COURSES USING SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

	Great Lakes	Farwest	New England	Hideast	Southwest	Rocky Mountains	Plains	Southenst	Total U.S.
Meen	125.59	162,49	126.29	96,03	69.81	102,48	99.48	61.97	104 12
S.D.	218.09	210.50	171.20	363, 43	165.16	156.18	474.18	141.35	106.32
N	459	314	110	435	182	85	225	363	273.17 2193

The variable, Enrollments in Biological Science Courses Using SCIP Materials correlated positively ($\alpha \leq 0.001$) in at least four of the eight regions with the following:

- +Enrollments in grades 9 thru 12
- +Enrollments in biology, chemistry, and physics
- +Enrollments in courses using biology, chemistry, physics, and earth science SCIP materials
- +Number of Teachers
- +Computer terminal available
- +SCIP biology course at 10th-12th grade selected for this survey

The regression analyses in Table 21 indicates that the best predictors for Teaching Experience Using Biology SCIP Materials were Biology Course Chosen for This Survey and Teacher's College Biological Science Credits. The college credits in biology is the more interesting of these two variables. In three of the eight regions and the total, this variable was the best predictor, accounting for 9 to 23 percent of the variance in experience with biology SCIP materials. In three of the remaining regions college credits in biology was the second predictor accounting for at least 5 percent of the remaining variance in each case. The Rocky Mountains and Mideast regions did not result in college credits in biology as a predictor of experience with SCIP materials for teaching biology. The partialling out of Total Student Enrollment and School Type did not affect the relationships between these variables.

The enrollments in SCIP biology courses were best predicted by enrollments in chemistry, physics, and earth science courses where SCIP materials were in use.

In three regions, Great Lakes, Farwest, and Southeast, the general enrollment for biology was a predictor for SCIP biology enrollment. This did not change after Total Student Enrollment was partialled out in two of the three regions. These results are given in Table 22.



37 TABLE 21

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHING EXPERIENCE USING BIOLOGY SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

Great L	akes (N =	459)	_			Mideast (N =	433)				
	Variable No. and Abbrev.	Multiple K	R Square	RSQ Change	Simple R			riable No. Abbrev.	Multiple R	R Square	RSQ Change	Simple R
Ail Variables Free	84 Course Bio 74 Hrs Bio	0.48	0.23 0.30	0.23	0.48 0.48	All Variables Free	84	Course Bio	0.43	0.18	0.18	0.43
Total Enroll. Forced	34 Tot Roll 84 Course Bio 74 Hrs Bio	0.06 0.49 0.55	0.00 0.24 0.30	0.00 0.23 0.06	0.06 9.48 0.48	Total Enroll. Forced	34 84	Tot Roll Course Bio	0.05	0.00 0.19	0.00	0.05
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 84 Course Bio		0.00 0.00 0.00 0.24	0.00 0.00 0.00 0.23	-0.02 0.06 -0.06 0.48	School Type Forced	15 16 17 84	Type J-Sr Type Sr Type Jr Course Bio	0.01 0.12 0.12 0.44	0.00 0.02 0.02 0.19	0.00 0.02 0.00 0.17	0.01 0.10 -0.12 0.43
School Type & Total Enroll, Forced	74 Hrs Blo 15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 84 Course Bio 74 Hrs Bio	0.55 0.02 0.07 0.07 0.08 0.49 0.55	0.30 0.00 0.00 0.00 0.01 0.24 0.30	0.06 0.00 0.00 0.00 0.00 0.23 0.06	0.48 -0.02 0.06 -0.06 0.48 0.48	School Type & Total Enroll. Forced	15 16 17 34 84	Type J-Sr Type Sr Type Jr Tot Roll Course Bio	0.01 0.12 0.12 0.13 0.44	0.00 0.02 0.02 0.02 0.19	0.00 0.02 0.00 0.00 0.17	0.01 0.10 -0.12 0.05 0.43
rarwest	$(N \simeq 309)$					Southwest	(N	~ 182)				
	Variable No. and Abbrev.	Hultiple R	R Square	RSQ Change	Simple R			iable No. Abbrev.	Miltiple R	k Square	RSQ Change	Simple R
All Variables Free	84 Course Bto 74 Hrs Bto	0.54 0.59	0.30 0.34	0.30	0.54 0.45	All Variables Free		His RGs SCIP RIS ROLL	0.31 0.40	0.09 0.16	0.09	0.31
Total Enroll. Forced	34 Tot Roll 84 Course Bio 74 Hrs Bio	0.11 0.55 0.59	0.01 0.30 0.35	0.01 0.29 0.05	0.11 0.54 0.45	Total Enroll. Forced	34 74	Tot Roll Hrs blo	0.27 0.38	0.07 0.14	0.07 0.07	0.27 0.31
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 84 Course Bio 74 Hrs Bio	0.07 0.17 0.19 0.55 0.60	0.01 0.03 0.04 0.31 0.36	0.01 0.02 0.01 0.27 0.05	0.07 0.13 -0.18 0.54 0.45	School Type Forced	15 16 17 74 31	Type J-Sr Type Sr Type Jr His Bio SCIP Bio Roll	0.14 0.19 0.20 0.36 0.43	0.02 0.03 0.04 0.13 0.18	0.02 0.02 0.01 0.09 0.06	-0.14 0.17 -0.12 0.31 0.31
School Type & Total Enroll. Forced		0.07 0.17 0.19 0.21 0.56 0.60	0.01 0.03 0.04 0.04 0.31 0.36	0.01 0.02 0.01 0.01 0.27 0.05	0.07 0.13 -0.18 0.11 0.54 0.45	School Type & Total Enroll. Forced	16 17 34	Type J-St Type Sr Type Jr Tot Roll Hrs Bio	0.14 0.19 0.20 0.30 0.40	0.02 0.03 0.04 0.09 0.16	0.02 0.02 0.01 0.05 0.07	-0.14 -0.17 -0.12 -0.31
New Engl	and (N ≃	130)			_	Rocky Mour	ıta	ins (N ≃	85)			
	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R			able No. Abbrev.	Multiple R	R Square	KSQ Change	Simple R
All Variables Free	84 Course Bio 74 Hrs Bio	0.52 0.59	0.27 0.35	0.27 0.07	0.52 0.45	All Varlables Free	39	CIP Phys Roll Parauing Roll Geol	0.38 0.48 0.54	0.14 0.23 0.30	0.14 0.09 0.06	0.38 0.29 0.36
Total Enroll. Forced School Type	34 Tot Roll 84 Course Bio 74 Hrs Bio 15 Type J-Sr	0.05 0.52 0.59	0.00 0.27 0.35	0.00 0.27 0.07	0.05 0.52 0.45	Total Enroll. Forced	10 9E	Tet Roll Roll Physics Pursuing Roll Earth	0.08 0.40 0.53 0.57	0.01 0.16 0.27 0.33	0.01 0.15 0.11 0.06	0.08 0.38 0.29 -0.25
Forced	16 Type Sr 17 Type Jr 84 Course Blo 74 Hrs Blo	0.13 0.21 0.57 0.62	0.02 0.04 0.31 0.39	0.09 0.01 0.28 0.06	0.08 -0.05 0.52 0.45	School Type Forced	16 17	Type J.Sr Type St Type Jr Ind Study	0.08 0.26 0.26 0.41	0.01 0.07 0.07 0.16	0.01 0.06 0.00 0.10	0.08 0.21 -0.23 0.27
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll	0.13 0.13 0.21 0.22	0.02 0.02 0.04 0.05	0.02 0.00 0.03 0.03	0.11 0.08 0.05 0.05		39 11	SCIP Phys Roll Pursulud Roll Physics Roll Physics	0.50 0.55 0.60 0.61	0.25 0.41 0.45 0.40	0.08 0.06 0.05 0.05	0.38 0.29 -0.25 0.38
	84 Course Bio 74 Hrs Bio	0.57	0.33	0.28	0.52	Total Enroll, Forced	16 17 134 134 139 139 131 1351 46 16	Type 1 for Type 37 Type 37 Tot Roll Roll Physics Porsuling Roll Earth Ind Scudy Class # Sct Fair	0.08 0.26 0.26 0.42 0.53 0.57 0.63 0.66	0.01 0.07 0.07 0.07 0.17 0.28 0.35 0.40 0.44	0.01 0.00 0.00 0.11 0.10 0.07 0.05 0.04	0.08 0.21 -0.23 0.08 0.38 0.29 -0.25 0.27 0.11 -0.07



Plains (N \approx 225)

		riable No. ! Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables	74	Hrs Bio	0.48	0.21	0.23	0.48
Free	17	Type Jr	0.53	0.28	0.05	-0.29
Total Enroll.	34	Tot Roll	0.00	0.00	0.00	0.00
Forced	74	Hrs Bio	0.48	0.23	C.23	0.48
	17	Type Jr	0.53	0.28	0.05	-0.29
School Type	15	Type J-Sr	0.13	0.02	0.02	0.13
Forced	16	Type Sr	0.28	0.08	0.06	0.15
	17	Type Jr	0.29	0.09	0.01	-0.29
	74	Hrs Bio	0.53	0.28	0.20	0.48
School Type &	15	Type J-Sr	0.13	0.02	0.02	0.13
Total Enroll.	16	Type Sr	0.28	0.08	0.06	0.15
Forced	17	Type Jr	0.29	0.09	0.01	-0.29
	34	Tot Roll	0.29	0.09	0.00	0.00
	74	Hrs Bio	0.53	0.28	0.20	0.48

Southeast (N \simeq 363)

		iable No. Abbrev.	Multiple R	k Square	RSQ Change	Simple R
All Variables Frec	74 84	Hrs Bio Course Bio	0.35 0.42	0.12 0.18	0.12 0.05	0.35 0.32
Total Enroll. Forced	34 74 84	Tot Roll Hrs Bio Course Bio	0.19 0.37 0.44	0.03 0.14 0.19	0.03 0.10 0.05	0.19 0.35 0.32
School Type Forced	15 16 17 74	Type J-Sr Type Sr Type Jr Hrs Bio	0.09 0.19 0.19 0.39	0.01 0.03 0.03 0.15	0.01 0.03 0.00 0.12	-0.09 0.19 -0.11 0.35
School Type & Total Enroll, Forced	15 16 17 34 74	Type J-Sr Type Sr Type Jr Tot Roll Hrs Bio	0.09 0.19 0.19 0.24 0.40	0.01 0.03 0.03 0.06 0.16	0.01 0.03 0.00 0.02 0.10	-0.09 0.19 -0.11 0.19 0.35

All Regions Combined (N \simeq 2193)

	٧a	riable No.	Multiple	R	RSQ	Simple
	and	Abbrev.	R	Square	Change	R
All Variables	74	Hrs Bio	0.42	0.17	0.17	0.42
Free	84	Course Bio	0.49	0.24	0.07	0.42
Total Enroll.	34	Tot Roll	0.11	0.01	0.01	0.11
Forced	84	Course Bio	0.43	0.18	0.17	0.42
	74	Hrs Bio	0.50	0.25	0.06	0.42
School Type	ţ5	Type J-Sr	0.03	0.00	0.00	د 0.0-
Forced	16	Type Sr	0.16	0.03	0.02	0.15
	17	Type Jr	0.16	0.03	0.00	-0.15
	74	HER BIO	0.44	0.19	0.17	0.42
	84	Course Blo	0.50	0.25	0.06	0.42
School Type &	15	Type J-Sr	0.30	0.00	0.00	-0.03
Total Entel!.	16	Type Sr	0.16	0.03	0.02	0.15
Forced	17	Type Jr	0.16	0.03	0.00	-0.15
	34	Tot Roll	0.18	0.03	0.00	0.11
	74	Hrs Bio	0.44	0.19	0.16	0.42
	84	Course Blu	0.50	0.25	0.06	0.42



TABLE 22

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF ENROLLMENTS IN BIOLOGICAL SCIENCE COURSES USING SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

Great L	ake	s (N = 4	59)				Mideast	(И)	" 433)				
	۷a	riable No.	Multiple	R	RSQ	Simple	li i		rlable No.	Multiple	R	RSQ	Simple
	#11	d Abbrev.	R	Square	Change	к			d Abbrev.	R	Square		н
All Variables Free	28 32		0.59 11 0.64	0.35 0.41	0.35 0.06	0.59 0.51	All Variables	s No	ne				
Total Enroll. Forced	34 32		0.54	0.29	0.29	0.54	Total Enroll.	. 34	Tot Roll	0.07	0,00	0.00	0.07
701744	08	SCIP Chem Ro Roll Blo	0.60 0.65	0.36 0.42	0.07 0.06	0.51 0.57	Forced						
School Type	15	Type J-Sr	0.15	0.02	0.02	-0.15	School Type	1°	, ,	0.05 0.17	0.00	0.00	-0.05 0.17
Forced	16 17	Type Sr Type Jr	0.24 0.24	0.06	0.03	0.23	Forced	13		0.18	0.03	0,00	-0.14
	28	Teach Sci	0.60	0.36	0.31	0.59	School Type &	. 19	Type J-Sr	0.05	0.00	0.00	-0.05
	32	SCIP Chem Ro		0.41	0.05	0.51	Total Enroll. Forced	. 16		0.17 0.18	0.03	0.03	0.17 -0.14
School Type & Total Enroll.	15 16	Type J-Sr Type Sr	0.15 0.24	0.02 0.06	0.02	-0.15 0.23	101044		Tot Roll	0.18	0.03	0.00	0.07
Forced	17	Type Jr	0.24	0.06	0.00	-0.14							
	34 28	Tot Roll Teach Sci	0.54 0.60	0.30 0.36	0.24 0.07	0.54 0.59							
	32	SCIP Chem Ro	11 0.64	0.41	ი.ია	0.51							
Farwest	(N	~ 309)					Southwest		1 ~ 182)				
10200	•	table No.	Multiple	R	RSQ	Simple	Journwest	_	•	Multiple	R	RSQ	Simple
	and	Abbrev.	R	Square	Change	ĸ			d Abbrev.	R	Square	Change	К
All Variables Free	08 32	Roll Bio SCIP Chem Rol	0.54	0.29 0.41	0.29	0.54 0.52	All Variables				0.20	0.20	0.45
							Free	32 34	SCIP Chem Roll Tot Roll	0.51 0.55	0.26 0.31	0.06 0.05	0.41
Total Enroll. Forced	34 08	Tot Roll Roll Blo	0.36 0.55	0.13	0.13	0.36 0.54	Total Earoll.	34	Tot Roll	0.42	0. 18	0.18	0.42
	32	SCIP Chem Rol		0.41	0.11	0.52	Forced	32	SCIP Chem Roll		0.28	0.10	0.41
School Type	15	Type J-Sr	0.10	0.01	0.01	-0.10	School Type	15	Type J-Si	0.11	0.01	0.01	-0.11
Forced	16 17	Type Sr 1ype Jr	0.35 0.35	0.12 0.12	0.11 0.00	0.35	Forced	16	Type Sr Type Jr	0.24 0.24	0.06	0.05 0.00	$0.24 \\ -0.19$
	32 33	SCIP Chem Roll Roll Bio	0.55	0.31	0.18	0.52		3 5	SCIP Phys Roll	0.47	0.22	0.16	0.45
_						1		35 35	SCIP Chem Roll CAE	0.52 0.57	0.27	0.05 0.05	0.41
School Type & Total Enroll.	15 16	Type J-Sr Type Sr	0.10 0.35	0.01	0.01	0.35	School Type &	15	Type J-Sr	0.11	0.01	0.01	-0.11
Fotced	17 34	Type Jr	0.35	0.17	0.00 0.08	~0.32	Total Enroll.	16	Type Sr	0.24	0.06	0.05	0.24
	32	Tot Roll SCIP Chem Rol		0.20 0.32	0.13	0.36 0.52	Forced	17 34	Type Jr Tot Roll	0.24 0.45	0.06 0.20	$0.00 \\ 0.14$	0.19 0.42
	08	Roll Bio	0.64	0.41	0.09	0.54		32	SCIP Chem Roll		0.29	0.09	0.41
New Engl	an	$d (N \approx 13)$	30)				Rocky Mou	nte	iins (N ≃	85)			
		iable No. Abbrev.	Multiple R	R Square	RSQ Change	Simple R			iable No. M Abbrev.	ultiple R	R Square	RSQ Change	Simple R
All Variables Free	25 32	Teach Sci Ful SCIP Chem Rol		0.36 0.46	0.36	0.60	All Variables Free	12 16	SCIP Chem Roll Type Sr	0.69	0.48	0.14	0.69
	30	SCIP ES Roll	0.72	0.52	0.05	0.50							
Total Enroll.	34	Tot Roll	0.42	0.18	0.18	0.42	Total Enroll. Forced	34 33	Tot Roll SCIP Phys Roll	0.42 0.72	0.1H 0.51	0.18 0.34	0.42
Forced	25 32	Teach Sci Ful SCIP Chem Roll		0.39 0.49	0.21 0.10	0.60 0.58		16	Type Sr	0.79	0.63	0.11	J.67
	30		0.13	0.54	0.05	6.50	School Type Forced	15 16	Type J-Sr	0.16	0.03	0.03	-0.16 0.67
School Type	15	Type J-Sr	0.06	J. 00	0.00	-0.06	7011611	1.7	Type Sr Type Jr	0.67	0.45	9.00	-0.52
Forced	16 17	Type Sr Type Jr	0.11 0.11	0.01 0.01	0.01	0.10		32	SCIP Chem Rall	0.79	υ. σ.'	0.18	0.69
	25	Teach Sc! Ful	$1 = 0$, $\epsilon \sigma$	9.45	9.15	9.40	School Type &	15	Type John	0.16	0.03	0.01	-0.16
	3 <i>2</i> 30	SCIP Chem Roll SCIP ES Roll	0.72	0.47 0.52	0.10 0.06	0.58	Total Enroll. Forced	16	Type Sr Type Jr	0.67 0.67	0.45 0.45	0.42	0.6/ -0.52
School Type &	15	Type J-Sr	0.06	0.00	0.00	-0.06		34	Tot Roll SULF Phys Holl	0. 69 U.79	0.47	0.03	$0.42 \\ 0.69$
Total Enroll.	16	Type Sr	0.11	0.01	0.01	0.10			TOTAL NOTE				
Forced	17 34	Type Jr Tot Koll	0.11	0.01 0.18	0.17	0.07							
	25	Teach Sci Ful SCIP Chem Rol	1 0.62	0.39	0.21	0.60							
	32 30	SCIP ES Roll	0.70 0.74	0.49 0.55	0.10 0.05	0.50							
											·		



Southeast ($N \simeq 363$)

		riable No. I Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables	08	Roll Bio	0.55	0.30	0.30	0.55
Free	33	SCIP Phys Ro	11 0.65	0.42	0.12	0.54
Total Enroll.	34	Tot Roll	0.54	0.29	0.29	0.54
Forced	33	SCIP Phys Re	0.63	0.40	0.11	0.54
School Type	15	Type J-Sr	0.00	0.00	0.00	0.00
Forced	16	Type Sr	0.31	0.10	0.10	0.27
	17	Type Jr	0.31	0.10	0.00	-0.24
	34	Tot Roll	0.58	0.33	0.24	0.54
	33	SCIP Phys Ro	0.65	0.43	0.09	0.54
School Type &	15	Type J-Sr	0.00	0.00	0.00	0.00
Total Enroll.	16	Type Sr	0.31	0.10	0.10	0.27
Forced	17	Type Jr	0.31	0.10	0.00	-0.24
	34	Tot Roll	0.58	0.33	0.24	0.54
	33	SCIP Phys Ro	11 0.65	0.43	0.09	0.54

All Regions Combined (N \approx 2193)

		riable No. I Abbrev.		Multiple R	R Square	RSQ Change	Simple R
All Variables Free	33 08	SCIP Phys Roll Bio	Roll	0.36	0.13 0.18	0.13 0.05	0.36 0.32
Total Enroll. Forced	34 33	Tot Roll SCIP Phys	Rol1	0.30 0.41	0.09 0.17	0.09	0.30 0.36
School Type Forced	15 16 17 33	Type J-Sr Type Sr Type Jr SCIP Phys	ƙo11	0.09 0.23 0.23 0.39	0.01 0.05 0.05 0.15	0.01 0.04 0.00 0.10	-0.09 0.23 -0.17 0.36
School Type & Total Enroll. Forced	15 16 17 34 33	Type J-Sr Type Sr Type Jr Tot Roll SCIP Phys	Roll	0.09 0.23 0.23 0.33 0.42	0.01 0.05 0.05 0.11 0.18	0.01 0.04 0.00 0.06 0.07	-0.09 0.23 -0.17 0.30 0.36

Plains (N ≃ 225)

		iable No.	Multiple R	R Square	RSQ Change	Simple R
Al' Variables Free	33 32	SCIP Phys Roll SCIP Chem Roll		0.21 0.27	0.21	0.46 0.16
Total Enroll. Forced	34 33 10 14	Tot Roll SCIP Phys Roll Roll Physics Roll Health	0.28 0.48 0.55 0.60	0.08 0.23 0.31 0.36	0.08 0.15 0.08 0.05	0.28 0.46 0.09 -0.02
School Type Forced	15 16 17 33 32	Type J-Sr Type Sr Type Jr SCIP Phys Roll SCIP Chem R.111	0.06 0.18 0.18 0.48 0.54	0.00 0.03 0.03 0.21 0.29	0.00 0.03 0.00 0.20 0.07	-0.06 6.18 -0.12 0.46 0.16
Schuol Type & Tatal Enroll. Forced	15 16 17 34 33 10	Type J-Sr Type Sr Type Jr Tot Rolf SCIP Phym Roll Roll Phymlen	0.06 0.18 0.18 0.32 0.49 0.57	0.09 0.03 0.03 0.10 0.24 0.33	0.00 0.03 0.00 0.07 0.14 0.09	-0.06 0.18 -0.12 0.28 0.46 0.08



This suggests that the relationship was not just due to school size. In those schools where biology was more popular, or in some way emphasized, the SCIP biology materials were more likely to be in use.

The relationship between numbers of college credits in biology and experience with SCIP biology materials suggests that those teachers with more biology coursework tend to use SCIP biology materials. If these two relationships are considered together it might be hypothesized that those schools with a relatively high number of biology students relative to the school's total enrollment tend to use SCIP biology materials and the teachers of these courses tend to have more extensive biology course backgrounds.

Chemistry

The two variables used as indicators of the use of SCIP in chemistry courses were:

Teaching Experience Using Chemistry Science Course Improvement Project Materials.

Enrollments in Chemistry Courses Using Science Course Improvement Project Materials.

The chemistry course SCIP materials referred to in these two variables include CHEMS and CBA.

The mean values for these variables are reported in Tables 23 and 24. These means indicate that a range of 3 to 15 percent have taught chemistry using SCIP materials. The teachers in the Southwest and the Southeast reported 3 percent and 5 percent having used SCIP materials for teaching chemistry while the Farwest region teachers had 15 percent reporting experience with these chemistry materials.

TABLE 23

MEANS^a AND STANDARD DEVIATIONS FOR TEACHING EXPERIENCE USING CHEMISTRY
SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

	Great Lakes	Farwest	New England	Midenat	Southwest	Mountains	Platus	Southeast	Total U.S.
Маап	0.10	0.15	0.12	0.08	0.03	0.11	0.10	0.05	0.09
S.D.	0.30	0.36	0.32	0.21	0.18	0.11	0.30	0.21	0.28
N	459	314	130	4.15	187	85	2.25	363	2193

TABLE 24

MEANS AND STANDARD DEVIATIONS FOR ENROLLMENTS IN CHEMISTRY COURSES USING SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

						Rocky	•		- · · · · · · · · · · · · · · · · · · ·
	Great Lakes	Farwest	New England	Mideast	Southwest	Mountains	Plains	Southeast	Total U.S.
Mean	38.44	48.66	48.94	23.90	15.81	22.49	28.93	14.12	30.14
s.b.	77.36	70.14	89.38	60.52	51.13	50.44	93.80	55.36	70.88
N	459	314	130	435	182	85	225	363	2193



The mean enrollments in chemistry courses using SCIP materials ranged from a low of 14.12 in the Southeast region to a high of 48.94 in the New England region. The regions reporting the highest enrollment figures also reported the greatest percentage of teachers with experience using the SCIP materials. These two variables showed a positive correlation ($\alpha \leq 0.001$) with each other in at least four of the eight regions. In addition, the variable, Teaching Experience Using Chemistry Science Course Improvement Project Materials, correlated positively ($\alpha \leq 0.001$) in at least four of the eight regions with the following:

+General enrollments in chemistry +School Type (Senior High) +Teacher's College Physical Science Credits

The variable, Enrollments in Chemistry Courses Using SCIP Materials correlated positively ($\alpha \leq 0.001$) in at least four of the eight regions with the following:

+Enrollments in 10th-12th grade science

+School Type (Senior High)

+Use of SCIP

+Enrollments in science courses using SCIP materials

+Number of Teachers

+Computer terminal available

+Ham radio available

+Teacher selected for survey teacher SCIP chemistry from 10th-12th grade

The regression analyses in Table 25 indicates that the best predictor of Teaching Experience Using Chemistry SCIP Materials was whether or not the selected class for this survey was a chemistry course. The enrollments in SCIP chemistry courses as reported in the regression analyses in Table 26 were best predicted by enrollments in other science courses using SCIP materials. The enrollment in SCIP physics courses was the best predictor in six of the eight regions. SCIP physics enrollments did not enter as a predictor ir the New England or the Mideast regions. In these regions, the enrollments in SCIP biology and general enrollments for chemistry were the best predictors. Generally, the predictors were not changed by partialling out Total Student Enrollment and School Type.

Physics

The two variables used as indicators of the use of SCIP in physics courses were:

Teaching Experience Using Physics Science Course Improvement Project Materials.

Enrollments in Physics Courses Using Science Course Improvement Project Materials.

The physics course SCIP materials referred to in these two variables include PSSC and HPP.



TABLE 25

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHING EXPERIENCE USING CHEMISTRY SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

	.akes (N ≃	Multiple	R	RSQ	Simple		(N ~ 433)	Multiple	R		
ull Varia bles	and Abbrev.	R	Square	Change	Ř		and Abbrev.	R T	\$quare	95Q Change	Simple R
700	85 Course Chem	0.53	0.28	0.28	0.53	All Variables Free	85 Course Chem	0.38	0.15	0.15	0.38
Notal Enroll. Porced	34 Tot Roll 35 Course Chem	0.20	0.30	0.04 0.26	0.20	Total Enroll. Forced	34 Tot Roll 55 Course Chem	0.02 0.38	0.00	0.00 0.15	0. 02 0.38
school Type forced	15 Type J-Sr 16 Type Sr 17 Type Jr 85 Course Chem	0.08 0.16 0.17 0.54	0.01 0.03 0.03 0.29	0.01 0.02 0.00 0.26	-0.04 0.16 -0.13 0.53	School Type Forced	15 Type J-Sr 15 Type Sr 17 Type Jr 85 Course Chem	0.03 0.16 0.17 0.39	0.00 0.03 0.03 0.15	0.00 0.03 0.00 0.12	0.03 0.13 -0.16 0.38
chool Type & otal Enroll.	15 Type J-3r 16 Type Sr 17 Type Ir 34 Tot Roll 85 Course Chem	0.08 0.16 0.17 0.23 0.55	0.01 0.03 0.03 0.05 0.30	0.01 0.02 0.00 0.02 0.25	-0.08 0.16 -0.13 0.32 0.53	School Type & Total Enroll. Forced	15 Type U-Ur 16 Type Gr 17 Type Jr 34 Tot Roll 85 Course Chem	0.03 0.16 0.17 0.17 0.39	0.00 0.03 0.03 0.03 0.15	0.00 0.03 0.00 0.00 0.12	0.03 0.13 -0.16 0.02 0.3d
Farwest	(N - 309)	•		- · · · · ·	. 	Sout burs	ı (N 18	2)	- ·		
	Variable No.	Multiple R	3	PSC	Simple		Variable No.	~ / Multiple	R	BHO	Simple
l Variables	95 Tourse Them 75 Hrs Phy Joi 82 SCIP Phys TE	3 0.44 3.51 0.56	0.20 0.26 0.31	0.20 0.07 0.05	9 0,44 0,41 -0,1+	All Variebles Free	and Abbrev. 85 Course Chem	0.31	8quare 0.09	0.09	0.31
tal Enroll.	34 Tot Poll 85 Tourse Them	2.04	0.00	0.00	0.64	Total Enroll.	34 Tot Roll 85 Course Chem	0.02	0.00	0.00	-0.02 0.31
	75 Hrs Pay Sci 82 SCIP Phys TE	0.51 0.56	0.26	0.07 0.05	0.44	School Type Farced	15 Type J-Sr 16 Type Sr	0.05	0.00	0.00	-0.05 0.12
oool Type roed	15 Type J-3r 16 Type Jr 17 Type Jr	2.05 2.17 - 14	0.00 0.03	9.00 9.02	-0.06 0.17		17 Type Jr 85 Course Chem	0.12	0.02	0.00 0.08	-0.10
	do Jourse Chem 75 Mrs Phy Joi 82 JOIP Phys TE	1,18 3,46 2,52 1,56	2.03 3.21 3.27 3.32	6.00 1.1 1 0.06 0.05	-0.16 0.44 0.41 -0.14	School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll	0.05 0.12 0.12 0.14	0.02 0.03 0.00 0.00	0.00 0.01 0.00 0.00	-0.05 0.12 -0.10 -0.02
oci Type & Al Enroll. ced	15 Type U-3r 15 Type Ir 17 Type Ur 34 Tot Poll 85 Course Chem 75 Hra Phy Col 82 SCIP Phys TE	0.06 0.17 0.18 0.14 0.46 0.42 0.56	0.00 0.03 0.03 0.03 0.21 0.27 0.32	0.00 0.00 0.00 0.00 0.16 0.06	-0.0s 0.17 -0.36 0.44 0.44 -0.14		ô5 Course Ch≪a	0.31	0.10	80.0	0.31
ew Engl	and (N - 1	30)		····		Rocky Mot	ıntalns (N	v 85)	. .		•
	Variable No. and Abbrew.	Multiple R	R Square	RSQ Chenge	Simple P		Variable No. and Abbrev.	Multiple	R	няо	Simple
ll Variables ree	85 Course Chem 40 MSF Inserv	0.41	0.17	0.17	0.41 0.34	All Variebles	85 Course Chem 67 Course Phys	0.63	0.39	0.19	0.6)
otal Enroll.	23 Sci Teach Wkep 34 Tot Roll	0.09	0.31	0.06	0.29	Total Enroll.	34 Tot Ball	0.71	0.04	0.04	0.28
orced	85 Course Chem 31 SCIP Bio Foli 23 Sci Teach Wksp	0.41 0.50 0.55	0.17 0.25 0.30	0.16 0.03 0.05	0.41 0.31 -0.29	Forced	3) Course Chem 87 Course Phys	0.53	0.50	0,46 0,11	0.63 0.28
shool Type	15 Type J-Sr 16 Type Sr	0.09	0.01	0.01	-0.01 2.00	School Type Forced	15 Type Jest 15 Type Ir 17 Type Jr	0.01 0.35 0.35	0.00 0.12 0.12	0.17, 0.17, 0.00	0.01 0.33 -0.31
	17 Type Jr 85 Course Chem 31 SCIP Bio Pull	0.09	0.13	0.30 0.15	0.02 0.41		85 Course Phys	0.64 3.71	0.51	3.69	0.63
bool De	23 Sci Teach Wkap	0.51	3.25 0.31	0.05	0.31	School Type & Total Enroll. Forced	15 Type Jair 16 Type Jr 17 Type Jr	0.01 0.35 0.35	0.00 0.12 0.12	0.00 0.12 0.00	0.01
hool Type & tal Enroll.	15 Type J-Sr 16 Type 3r 17 Type Jr	0.09 0.09 0.09	0.01 0.01 0.01	0.01 0.00 0.00	-0.09 0.06 -3.32		34 Tot Poll 85 Course Chem	0.16 0.64	0.13	0.01	-0.31 0.19 0.63
rced	34 Tot Poll 85 Course Chem	0.13	0.02	0.01	0.07		87 Course Phys	0.71	0.51	٧٠.٥	0.28
rced	31 SCIP Bio Poll 23 Sei Teach Wkap	0.52 0.57	0.32	0.08 0.05	0.31 -0.29	ı					



TABLE 25 Continued

 $\overline{\text{Plains (N = 225)}}$

	Wariable No. and Abbrev.	Multiple R	R Square	RSQ Chango	Simple R
All Variables Free	75 Hrs Phy Sci 85 Course Chem 82 SCIP Phys TE 08 Roll Bio	0.54 0.54 0.59 0.63	0.20 0.29 0.34 0.39	0.20 0.09 0.05 0.05	0.44 9.44 -0.08 0.30
Total Enroll. Forced	34 Tot Roll 85 Course Chem 75 Hrs Phy Sci 82 SCIP Phys TE	0.19 0.48 0.55 0.60	0.04 0.23 0.30 0.35	0.04 0.19 0.07 0.05	0.19 0.44 0.44 -0.08
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 85 Course Chem 75 Ers Phy Sci 82 SCTP Phys TE	0.13 0.32 0.32 0.49 0.56 0.61	0.02 0.11 0.11 0.24 0.31 0.37	0.02 0.09 0.00 0.13 0.07 0.06	-0.13 0.32 -0.21 0.44 0.44 -0.08
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 65 Course Chem 75 Ers Pry Sci 82 SCIP Phys TE	0.13 0.32 0.32 0.35 0.51 0.56 0.61	0.02 0.11 0.11 0.12 0.26 0.31 0.38	0.02 0.09 0.00 0.02 0.14 0.06 0.06	-0.13 0.32 -0.21 0.19 0.14 0.14 -0.08

$\overline{\text{Southeast}}$ (N \approx 363)

	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	85 Course Chem	0.33	0.13	0.11	0.33
Total Enroll. Forced	34 Tot Roll 85 Course Chem	0.11	0.01 0.12	0.01 0.10	0.11
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 85 Course Chem	0.03 0.14 0.14 0.33	0.00 0.02 0.02 0.11	0.00 0.02 0.00 0.09	0.03 0.10 -0.13 0.33
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 85 Course Chem	0.03 0.14 0.14 0.17 0.34	0.00 0.02 0.02 0.03 0.12	0.00 0.02 0.00 0.01 0.09	0.03 0.10 -0.13 0.11 0.33

All Regions Combined (N = 2193)

	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	85 Course Ch	0.42	0.17	0.17	o. L2
Total Enroll. Forced	34 Tot Roll 85 Course Che	0.12 0.43	0.01 0.18	0.01 0.17	0.12 0.12
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 85 Course Che	0.05 0.18 0.18 0.18	0.00 0.03 0.03 0.18	0.00 0.03 0.30 0.15	-0.05 0.17 -0.15 0.42
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Jr 17 Type Jr 34 Tot Roll 85 Course Che	0.05 0.18 0.18 0.19 0.43	0.00 0.03 0.03 0.04 0.19	0.00 0.03 0.00 0.00 0.15	-0.05 0.17 -0.15 0.12 0.12



TABLE 26

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF ENROLLMENTS IN CHEMISTRY COURSES USING SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

Great :	Lake	s (N ≃	459)				Mideast	$(N \approx 433)$				
		riable No. 1 Abbrev.	Multip:	le ș Squar	RSQ • Change	Simple R		Variable No.	Multiple	P	RSQ	Simple
All Variabl		SCIP Phys Rol Roll Chem	.1 0.68 0. <i>T</i> 2	0.46 0.52	0.46 0.06	0.58	All Variables	and Abbrev.	.R 0.46	Square 0.21	Change 0.21	я 0.46
Total Enrol		Tot Roll SCIP Pays Rol	0.52	0.28	0.28 0.24	0.52	Total Enroll.	34 Tot Pol1	0.25	0.00	0.06	0.25
School Type Forced	16	Type J-Sr Type Sr	0.15	0.02 0.08	0.02 0.06	-0.15 0.28	School Type Forced	09 Roll Chem 15 Type Jacr 16 Type Sr	0.46 9.12	0.21	0.15	0.46 -0.12
	33	Type Jr SCIP Phys Roll Roll Chem	0.28 0.68 0.72	0.08 0.47 0.52	0.00 0.39 0.05	-0.20 0.68 0.55	10.142	16 Type Sr 17 Type Jr 09 Roll Them	0.12 0.12 0.47	0.10 0.22 0.22	0.00	0.12 -0.24 0.46
School Type Total Enroll Forced	1. 16 17 34	Type J-Sr Type Sr Type Jr Tot Boll SCIP Paye Boll	0.15 0.28 0.28 0.54 0.72	0.02 0.08 0.08 0.29 0.52	0.02 0.06 0.00 0.21 0.23	-0.15 0.28 -0.20 0.52 0.68	School Type & Total Enroll. Forced	15 Type J-Br 16 Type Br 17 Type Jr 34 Tot Moll 09 Roll Chem	0.12 0.32 0.32 0.36 0.47	0.02 0.10 0.10 0.13 0.22	0.09 0.00 0.09 0.09	-0.12 0.32 -0.36 0.25 0.46
		22.0										
Farwest	·	,-,					Southwes	t (N ≈ 182))			
All Variable	and .	able No. Abbrev,	Multiple R	Square	RSQ Change	Simple R		Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R
Free	33 :	SCIP Pays Soll SCIP Blo Roll	თ. 56 თ. არ ი. 70	0.31 0.43 0.49	0.31 0.12 0.06	0.56 0.55 0.52	All Variables Free	30 SCIP Phys Poll 30 SCIP Es Roll	0.44	0.19 0.26	0.17	0.44
Total Enroll. Forced	33 3	Not Poll SCIP Phys Roll SCIP Bio Poll	9.41 9.61 9.67	0.17 0.37 6.45	0.17 0.20 0.09	0.41 0.55 0.52	Total Enroll. Forced	33 SCIP Phys Poll 30 SCIP Es Roll	0.26 0.44 0.51	0.07 0.19 0.26	0.07 0.13 0.07	0.26 0.44 0.31
School Type Forced	16 7 17 7 33 S 31 S	ype J-Sr ype Sr ype Jr CIP Phys Poll CIP Bio Poll oll Chem	0.08 0.33 0.34 0.58 0.66 0.70	0.01 0.11 0.11 0.13	0.01 0.11 0.00 0.22 0.10	-0.08 0.11 -0.31 0.55 0.57	School Type Forced	15 Type U-Sr 46 Type Sr 17 Type Ur 33 SCIP Thys Holl 30 SCIP Es Holl	0.08 0.18 0.20 0.45 0.52	0.01 0.03 0.04 0.20 0.27	0.01 3.03 0.00 0.16 0.07	-0.08 0.18 -0.16 -0.44 0.31
School Type & Total Enroll. Forced	15 T 16 T 17 T 34 To 33 Sc		0.08 0.33 0.34 0.47 0.62 0.68	0.49 0.11 0.11 0.22 0.38 0.46	0.06 0.11 0.00 0.11 0.16 0.07	0.%6 -0.08 -0.09 -0.01 -0.01 0.00 9.02	School Type & Total Enrull. Forced	15 Type Jer 10 Type Sr 10 Type Sr 34 Tot Roll 33 BCIP Phys Roll 30 BCIP Es Roll	0.08 0.18 0.20 0.30 0.45 0.52	0.01 0.03 0.04 0.09 0.20 0.27	0.01 9.04 9.00 9.00 9.05 9.12 9.07	-0.08 0.18 -0.16 -0.26 0.44 0.41
ew Engl	and	(N = 13	30)	· • · • · · · · ·			Rocky Mou	mtains (N	~ 85)			* = -
	Variat		(ultiple P :		PRQ 5:	imple R		Variable No and Abbrev.	Hultiple N	e Square	"hange	oimple R
l Variables	31 SC 26 Te	TP Bio Boll ach Sci M	0.59 0.64			0.58	All Variaties Free	19 1117 Phys Pull 1 JOTP Bir Pull	9.75 9.79	5 57 1.53	ა.57 ს.მი	0.76 0.09
tal Enroll. roed	32 3C	t Roll IP Bio Soll ach Buy Eq	0.53	9.95	2.19	1,544 1,775 1,44		74 Feb Mo11 18 SCIP Hgs C .1	0,42	0.12	0.14) (1) 1.76
bool Type roed	15 57 16 57 17 57 31 80	pe J-Sr pe Sr pe Jr	9.03 9.25 9.15	3,00 g 9,72 e 6,62 g	0,000 - 3 1,000 - 3 1,000 - 1 1,000 - 1		Forced	.5 Dyje ilir 16 Type r 17 Dyje to 15 Otto Hige H .1	2.000 2.44 2.44 2.44 3.77	2001 0.14 2.24 2.34	05,00\$ 05,040 53,45	=0.0d 1.44 47 74
	15 TVT 10 TVT 17 TVT 34 Tot 31 SCI	De J-Br De Jr De Jr FROII IP BIO ROII	0.03 0.15 0.15 0.44 0.62	0.00 0 0.02 0 0.19 0 2.39 0	,50 -0 ,02 0 ,00 -0 ,17 0 ,19 0	.04	Total Enroll. Forces	: Type or : Pype or 1/ Type or 3- Tot Woll 33 SCIP Phys Mall	9, 9 9, 9 9, 9 9, 35 0, 79	0,24 0,24 0,41 0,62	0.00 0.00 0.06 0.31	61 08 1299 20 90 0.47 0.76



TABLE 26 Continued Plains (N \simeq 225)

	Variable No. and Abbrev.		Multiple R	R Square	RSQ Change	Simple R
All Variables Free	33 SCIP Phy 12 Roll Geo		0. <i>7</i> 2 0.82	0.52 0.67	0.52 0.15	0.72 0.60
Total Enroll. Forced	34 Tot Roll 09 Roll Che 33 SCIP Pby	3	0.26 0.75 0.86	0.07 0.57 0.75	0.07 0.50 0.18	0.26 0.68 0.72
School Type Forced	15 Type J-S 16 Type Sr 17 Type Jr 33 SCIP Fry 12 Roll Geo	Roll	0.05 0.15 0.15 0.72 0.32	0.00 0.02 0.02 0.53 0.68	0.00 0.02 0.00 0.50 0.15	0.05 0.10 -0.14 0.72 0.60
School Type & Total Enroll. Forced	15 Type J-S: 16 Type Sr 17 Type Jr 34 Tot Roll 09 Roll Cher 33 SCIP Phys	1	0.05 0.15 0.15 0.31 0.76 0.87	0.00 0.02 0.02 0.10 0.58 0.76	0.00 0.02 0.00 0.07 0.48 0.13	0.05 0.10 -0.14 0.26 0.68 0.72

Southeast (N \approx 363)

	Variable No.		Multiple R	R Square	RSQ Change	Simple P
All Variables Free	33 SCIP Phy	s Roll	0.80	0.63	0.63	0.80
Total Enroll. Forced	34 Tot 9011 33 SCIP Phy		0.42	0.17	0.17 0.46	0.42
School Type Forced	15 Type J-S 16 Type Sr 17 Type Jr 33 SCIP Pby		0.01 0.20 0.20 0.80	0.00 0.0- 0.04 0.64	0.00 0.04 0.00 0.60	0.01 0.17 -0.15 0.20
School Type & Total Enroll. Forced	15 Type J-S 16 Type Sr 17 Type Jr 34 Tot Roll 33 SCIP Phys 09 Roll Chem	Fall	0.01 0.20 0.20 0.44 0.30 0.83	0.00 0.04 0.04 0.19 0.64 0.69	0.00 0.04 0.00 0.15 0.45 0.05	0.01 0.17 -0.15 0.42 0.80 0.65

All Regions Combined (N = 2193)

	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	33 SCIP Phys Rol 09 Roll Ches	0.57 0.65	0.33 0.42	0.33 6.09	0.57 0.51
Total Enroll.	34 Tot Roll 33 SCIP Phys Rol	0.40	0.16 0.38	0.16	0.40 0.57
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 33 SCIP Phys Roll 09 Roll Chem	0.08 0.27 0.27 1 0.59 0.65	0.01 0.07 0.07 0.35 0.42	0.01 0.07 0.00 0.27 0.07	-0.08 0.26 -0.22 0.57 0.51
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 33 SCIP Phys Roll	0.08 0.27 0.27 0.43 1 0.62	0.01 0.07 0.07 0.19 0.39	0.01 0.07 0.00 0.11 0.20	-0.08 0.26 -0.22 0.40 0.57



The mean values for these two variables are reported in Tables 27 and 28. These means show a range of from 2 percent of the teachers of the Rocky Mountains region to 15 percent of the New England region reporting experience using SCIP materials in teaching physics.

TABLE 27

MEANS^a AND STANDARD DEVIATIONS FOR TEACHING EXPERIENCE USING PHYSICS SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

					Rocky						
	Great Lakes	Farvest	New England	Mideast	Suuthwest	Mountains	Platus	Southeast	Total U.S.		
Mean	0.07	0.10	0,15	0.06	0.04	0.02	0.06	0.06	0.07		
s.v.	0.26	0.29	0.35	0.23	0.19	0.15	0.23	0.24	0,25		
N	459	314	130	415	182	85	225	363	2193		

TABLE 28

MEANS AND STANDARD DEVIATIONS FOR ENROLLMENTS IN PHYSICS COURSES USING SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

	Great Lakes	Farwest	New England	Midment	Southwest	Mountains	Plains	Southment	Total U.S
Kean	19.53	22.97	24.69	15.93	10.47	11.36	19.85	5.76	16.30
S.D.	39.38	36.61	46.66	45.60	29.88	26.62	67.43	19.50	41.47
N	459	314	130	4.15	182	85	225	363	219)

The mean enrollment in physics courses using SCIP materials ranged from a high of 24.69 in the New England region to a low of 5.76 in the Southeast. These two variables were significantly correlated ($\alpha \leq 0.001$) in four of the eight regions.

The variable, Teaching Experience Using Physics SCIP Materials had a significant ($\alpha \leq 0.001$) positive correlation in at least four of the eight regions for the following:

- +General enrollment in biology
- +Teacher's College Physical Science and Mathematics Credits
- +Twelfth grade physics course using SCIP materials chosen for this survey

A significant negative correlation was obtained for the teaching experience with SCIP materials and

- -Teacher's College Biology Credits
- -Biology course chosen for this survey



The variable, Enrollments in Physics Courses Using SCIP Materials correlated positively ($\alpha \leq 0.001$) in at least four of the eight regions with the following:

+General enrollments in 9th thru 12th grade science courses (basic and advanced)

+Use of SCIP

+Enrollments in courses using SCIP at high school level

+Number of Teachers

+Teacher selected for survey teaches SCIP physics at 11th or 12th grade level

+Computer terminal available

+Ham radio available

+Teacher's College Science Credits

The regression analyses results in Table 29 indicate that the best predictors of Teaching Experience Using Physics SCIP Materials is whether or not the selected class for this survey was a physics course. College credits in mathematics or in physical science were predictors of experience with SCIP for three of the regions, Mideast, Southwest, and Plains. The predictor of enrollments in SCIP physics courses as reported in Table 30 was enrollment in SCIP chemistry courses in six of the eight regions. The New England region SCIP physics enrollments were best predicted by SCIP biology enrollments. In the Southwest region the general physics enrollment was the best predictor followed by the SCIP chemistry enrollments.

The percent variance accounted for by use of SCIP chemistry enrollments was reduced when Total Student Enrollment was partialled out but the SCIP chemistry enrollment still contributed the most to the prediction. This would indicate a slight dependence of SCIP Physics Enrollments on school size.

Teacher Participation in National Science Foundation Institutes

Information concerning this variable was obtained from the responses to the Science Teacher Questionnaire. The teachers were asked to indicate the years they had participated in NSF-sponsored institutes. The institutes included for their responses were Academic Year (AYI), In-Service, Summer, and NSF Research Institutes.

Less than 10 percent of the responding teachers had participated in the AYI program while 51 percent and 22 percent had participated in summer and in-service programs respectively. The summer and in-service program participation variables were selected for further analysis.

The mean values for Teacher Participation in National Science Foundation In-Service Institutes and for Teacher Participation in National Science Foundation Summer Institutes are given in Tables 31 and 32. The means represent the average number of institutes attended from 1961 thru 1970.



TABLE 29

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHING EXPERIENCE USING PHYSICS SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

Great L	ake	s (N ≃ 45	9)				Mideast	(N	° 433)				
		sriable No. nd Abbrev.	Multiple R	R Square	RSQ Change	Simple R	:		ariable No. ad Abbrev.	Multiple R	R Squere	RSQ Change	Simple R
All Variable From	8	7 Course Physl	cs 0.50	0.25	0.25	0.50	All Variables	87 77		0.38	0.14	0.14 0.05	0.38 0.33
Total Enroll Forced	. 34		0.03 cs 0.51	0.00 0.26	0.00	0.03 0.50	Total Enroll Forced	34 87 77	Course Physic	0.00 a 0.38 0.44	0.00 0.14 0.19	0.00 0.14 0.05	-0.00 0.38 0.33
School Type Forced	110	5 Tyne Sr 7 Type Jr		0.01 0.02 0.02 0.27	0.01 0.01 0.00 0.25	-0.09 0.15 -0.11 0.50	School Type Forced	15 16 17 87	Type J-Sr Type Sr Type Jr Course Physic	0.06 0.18 0.18	0.00 0.03 0.63 0.16	0.00 0.03 0.00 0.12	-0.06 0.18 -0.13 0.38
School Type & Total Enroll Forcad		Type Sr Type Jr Tot Roll	0.09 0.15 0.15 0.16 0.52	0.01 0.02 0.02 0.02 0.02	0.01 0.01 0.00 0.00 0.25	-0.09 0.15 -0.11 0.03 0.50	School Type 6 Total Enroil. Forced	16 17 34 87	Type J-Sr Type Sr Type Jr Tot Rall	0.45 0.06 0.18 0.18 0.20 0.40 0.46	0.20 0.00 0.03 0.03 0.04 0.16 0.21	0.05 0.00 0.03 0.00 0.00 0.13	0.33 -0.06 0.18 -0.13 -0.00 0.38 0.11
Farwest	(N	~ 309)					Southwes	t (N ~ 182)				
		rlable No. d Abbrev.	Multiple R	R Square	RSQ Change	Simple R			riable No. d Abbrev.	Multiple R	R Square	RS() Change	Simple K
All Variables Free	87	Course Physic	s 0.41	0.17	0.17	0.41	All Variables Free	87 77	Course Physics Hrs Math	0.48	0.21	0.21	0.48
Total Enroll. Forced	34 87	-	0.03	0.00 0.17	0.00	0.01	Total Enroll. Forcad	34 87 77	Tot Roll Course Physics Hrs Math	0.02 0.48 0.56	0.00	0.00	0.02
School Type Forced	15 16 17 87	21	0.05 0.16 0.16 9.43	0.00 0.03 0.03 0.18	0.00 0.02 0.00 0.16	-0.05 0.16 -0.14 0.41	School Type Forced	15 16 17 87	Type J-Sr Type Sr Type Jr	0.05 0.12 0.12	0.00 0.01 0.01	0.09 0.00 0.01 0.00	0.42 0.05 0.07 -0.11
School Type & Total Enroll. Forced		Type Sr Type Jr Tot Roll	0.05 0.16 0.16 0.16 0.16	0.00 0.03 0.03 0.03 0.18	0.00 0.02 0.60 0.00 0.15	-0.05 0.16 -0.14 0.03 0.41	School Type & Total Enroll. Forced	77 15 16 17 34 87	Course Physics Hrs Meth Type J-Sr Type Sr Type Jr Tot Roll Course Physics Hrs Math	0.48 0.56 0.05 0.12 0.12 0.12 0.48 0.56	0.23 0.32 0.60 0.61 0.01 0.01 0.23 0.32	0.22 0.09 0.00 0.01 0.00 0.00 0.22 0.09	0.48 0.42 0.05 0.07 -0.11 0.02 0.48 0.42
New Engl	an d	1 (N = 130))				Rocky Mou	nt	ains (N =	85)			
		iable No. Abbrev.	Multiple R	R Square	RSQ Chenge	Simple R			iabla No. P Abbrev	fultiple R	R Square	RSO Change	Simple R
Free		Course Physics		0.55	0.55	0.74	All Variables Free	47 08	Course Physics Lecture Roll Bio	0.13 0.42 0.49	0.11 0.18 0.24	0.11 0.07 0.0n	0.33 0.21 -0.10
otal Enroil. orced chool Type	97 15	Tot Roll Course Physics Type J-Sr	0.03 0.74 0.00	0.90 0.55 0.00	0.00 0.35 0.00	-0.03 0.74 -0.00	Total Enrolt.	14 87	Type Sr Tor Roll Course Physics	0.55	0.40 0.00 1.12	0.0 0 0.00 0.11	0.19 -0.04 0.13
orced	16 17 87	Type Sr Type Jr Gourse Physics	0.11 0.11 0.74	a.o: a.a; a.a;	0.01 0.00 0.54	0.08 -0.10 -5.74		08	Lecture Roll Bio Type Sr	0.44 0.50 0.56	0.19 0.25 0.31	9,08	0.21 -0.19 0.19
chool Type & otal Enroll. orced		Type J-Sr Type Sr Type Jr Tot Roll Course Physics	0.00 0.11 0.11 0.12 0.74	0.00 0.01 0.01 0.01 0.55	0.01 0.00	-0.00 0.08 -0.10 -6.01	Schuol Type Forced	16 17 08	Type J-Sr Type Sr Type Jr Roll Bto Course Physics	0.05 0.19 0.19 0.41 0.51	0.00 0.01 6.03 0.16 9.26	0.03 0.00	-0.05 -0.19 -0.14 -0.10 -0.31
							Toral Enroll Porced	16 17 34 08 1	Type J-St Type St Type Jr Tot Roll Roll Bio Course Physics	0.05 9.19 0.19 0.23 0.43 0.53	0.03 0.03 0.05 0.18	0,61 0-60 0,02	-0.05 0.19 -0.14 -0.05 -0.10



TABLE 29 Continued

TABLE 2	9 (Continued				
Plains	(N	° 225)				
		ariable No. nd Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variable		7 Course Physic	cs 0.44	0.19	0.19	0.44
Free		5 Hrs Phy Sci	0.50	0.25	0.06	0.39
	8		0.54 0.58	0.29 0.33	0.04	-0.08
	·	o kori bio	0.50	0.33	0.05	0.26
Total Enroll Forced	8		0.20 s 0.47	0.04	0.04	0.20 0.44
School Type	1	5 Type J-Sr	0.02	0.00	0.00	-0.02
Forced	14	2.	0.19	0.04	0.04	0.17
	8	• •	0.19	0.04	0.00	-0.16
	7:		s 0.45 0.50	0.20 0.25	0.17	0.44
	80			0.30	0.05	-0.08
School Type 6			0.02	0.00	0.00	-0.02
Total Enroll. Forced	. 16		0.19 0.19	0.04	0.04	0.17
101000	34		0.27	0.07	0.03	-0.16 0.20
	87			0.23	0.15	0.44
	75		0.51	0.26	0.04	0.39
	80	SCIP Chem TE	0.56	0.31	0.05	-0.06
Southeas	t	(N ~ 363)				
		riabla No. od Abbrev.	Multiple R	p Square	RSQ Change	Simple R
All Variables	87	Course Physic	s 0.43	0.19	0.19	0.43
Pree	32			0.28	0.09	0.35
Total Enrell.	34 87		0.14	0.02	0.02	0.14
Forced	33			0.20 0.28	0.18	0.43
		0011 111/0 1101	. 0.,,,	0.40	0.00	0.37
School Type	15		0.10	0.01	0.01	0.10
Forced	16		0.19	0.04	0.02	0.09
	17 87		0.19 s 0.45	0.04	0.00 6.17	-0.15
	33			0.29	0.17	0.43
					0.00	0.07
School Type &			0.10	0.01	0.01	0.10
Total Enroll.	16 17	- 2 1	0.15	0.04	0.02	0.09
Forced	34		0.19	0.04	0.00 0.02	-0.15 0.14
	87			0.21	0.16	0.43
	33			0.29	0.08	0.39
All Regio	ns	Combined	(N ≃	2193)		
			Mulciple	R	ne '	
	and	l Abbrev.	R	Square	Change	Simple R
All Variables Prue	87	Course Physics	0.46	0.21	0.21	0.46
Total Enroll.	34	Tot Roll	0.06	0.00	0.00	0.06
Forned	87	Course Physics	0.47	0.22	0.21	0.46
School Type	15	Type J-Sr	0.02	0.00	0.00	
Forced	16	Type J-Sr Type Sr	0.02 0.16	0.00	0.00	-0.02 0.15
	17	Type .!c	0.16	0.03		-0.15
	87	Course Physics	0.47	0.22	0.20	0.46
School Type &	1 6	Tun- 1 C-				
Total Encoll.	15 16	Type J-Sr Type Sr	0.02 0.16	0.00		.0.02
Forced	17	Type Jr	0.16	0.03 0.01	0.00	0.15 -0.14
	34	Tot Roll	0.16	0.05	0.00	0.66
	87	Course Physics	0.47	0.22	0.20	0.46



TABLE 30

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF ENROLLMENTS IN PLYSICS COURSES USING SCIENCE COURSE IMPROVEMENT PROJECT MATERIALS

Great	Lakes (N = 4	59)				Mideast	(N = 433)				
	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R		Variable No. and Abbrev.	Multiple R	R Bquare	PEQ Change	Simple B
All Variable	s 32 SCIP Chem Roll	0.68	0.46	0.46	84.0	All Veriables Free	말 - Wiff Chem Rol	0.33	0.11	0.11	0.33
Total Enroll Forced	. 34 Tot Roll 32 SCIP Chem Poll	0.46 0.69	0.21 0.47	0.21	ი.სა მმ. €	Total Enroll.	6- 11t 3011 W - 117 Them Bol	0.13 L 0.11	0.02	0.02 0.02	0.15
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr	0,15 0,28 0,28	0.02 80.0 80.0	0.02 0.06 00.00	-0.15 0.28 -0.20	School Type Forced	15	0.09 04 04 0.45	0.01 0.04 0.04 0.14	0.01 0.77 0.30 0.30	-0.09 0.27 -0.27 0.33
School Type Total Enroll Forced		0.15 0.28 0.28 0.48 0.69	0.02 0.08 0.08 0.23 0.48	0.02 0.06 0.00 0.15 0.25	-0.15 0.28 -0.20 0.46 0.68	School Type & Total Enroll. Forced		0.26 0.28 0.29	0.01 0.08 0.08 0.08 0.14	0.01 0.07 0.00 0.00 0.00	-0.00 0.06 -0.02 0.13 0.33
Farwest	(N = 309)				···	Southwes	t (N = 182	· · · · · · · · · · · · · · · · ·			· - ·
	Variable No.	Multiple 3	p Square	RSQ Change	"imple		Variable No.	Multiple A	R	P.P.Q	fimple
All Variables Free		0.55	0.30	0.10	J.*5	All Variables Free	10 Foll Physics 2 SCIP Chem Roll	0,55 0,65	0,42 0,47	O.L.	3.65 0.44
Total Enroll. Forced	34 Tot Poli 32 SCIF (hem Poli	0.30 0.55	0.09 0.11	0.09	1.30 0.55	Total Enrull. Forced	34 Tit Moll 10 Roll Physics	0,40 0,67	0.25	0.25	0.50
School Type Forced	15 Type (1-3r 15 Type (r 17 Type (r	0.08 3.40 0.80	0.01 9.39 8.00	0.01 0.3≃ 0.30	-0.0% 0.5 -0.54	School Type	32 SCIP Cham Woll 15 Type 1-3r	0.71 0.68	0.50	0.05	0.44 -0.08
Senoul Type &	32 STIP Them Roll 15 Type 141r	1146 2156	3. si	5.23 5.21	-0.	forced	1h Type Or 17 Type Ir 10 Roll Physics 32 SCIP Chem Holl	0.21 0.72 0.65 Edgy	0.04 0.05 0.42 0.47	0.6% 0.30 0.47 0.00	0,21 -0,19 0,65 0,44
Total Enroll. Forced	16 Type of 17 Type for 34 Tot Poll 32 SCIP Them Poll	9.30 9.39 9.35 9.37	7.04 9.09 0.14 0.32	0.08 0.00 0.00 3.18	2.0	3chool Type & Total Enroll. Forced	15 Type 3-5r 10 Type ur 17 Type ur 3- Tot Rull 10 Roll Physics 32 SCIP Chem Poil	0.08 0.21 0.27 0.52 0.52 0.57	0.01 0.04 0.05 0.27 0.46 0.50	0.01 0.04 0.00 0.23 0.18 0.05	-0.68 0.21 -0.19 0.50 0.65
New Engl	.and / ≃ 13	0)	the a second			Rocky Moi	mtains (N	≈ 85)			Transference and and
	Variable ().	Multiple R :	R Square o	RSQ Thanks	Simple		Variable So.	Multiple	В	R54	Simple
All Variables Free	31 JCIP #1: Toll 10 Poll FF 12 29 SCIP P. 11	0.45 0.40 0.60	0.20	0,20 0.11 0.00	7,41	All Variables	And Abbrev. 5 115 Them Not1 10 Fall Physics	ह ७.१६ ५.५८	3 *7	0.57 0.57 0.00	9 0.04 246 t
Total Enroll. Forced	34 Tot Boll 31 CTIT Bio Boll 10 Boll Physics 29 SCIP PS Boll	Si, sh 2. Th	21	0.08 0.17 0.10 0.06	0.29 0.25 0.11		THE LOT MILE WE SHE SHEET WILL OF MALE PROVIDES OF SCHOOL BLD FOR	5. (* 2. * 2.10 2.10	1.21 * 1 *	9.11 (9.2) (2.5)	0.34
School Type Forced	15 Type U-Sr 16 Type Ur 17 Type Ur 31 TCTP BIO Holl 10 Moll Thysics 29 SCIP 23 Foll	0.16 0.17 0.40	0.00 0.002 0.41 0.71	5.52 4.00 4.19 5.13	-0.07 -0.15 -0.15 -0.15 -0.55	Forca 1	in Tyle 2- r The Dyle 3r The Type Ir W SITP Them first The Hold Hyates If the Direction of the Site of the Si	n 11 n an n an n an n an n an n an	65.5	1	-(), {\(\delta\) = \(\delta\),
Total Enroll. Forced	15 Dype 1- r 10 Dype 1r 17 Dype 1r 34 Tot Foll 31 SCIP 310 Roll 10 Foll Physics	6. 77 0. 10 0. 15 0. 30 0. 47	0.00 0 0.02 0 0.04 0 0.04 0	1 00		Forced :	in type or r r type or r type or ye for soir Soir Shee Poil to Poil Physics sl Soir Bio Roil	0 - 27 0 - 27 0 - 27 0 - 20 0 - 20	13,74 14,73 15,26 17,59 13,64	11 1 1 21 3 3 1 9 2	-0.10 -1.40 -0.14 -0.15 -0.76 -0.63 -0.59



TABLE 30 Continued Plains (N \approx 225)

	Variable No. and Abbrev.	Multiple R	p Square	RSQ Change	Simple R
All Variables Free	32 SCIP Chem Roll 31 SCIP Bio Rell	0.72 0.80	0.52	0.52 0.12	0.72 0.46
Total Enroll. Forced	34 Tot Roll 32 SCIP Chem Roll 31 SCIP Bio Roll	0.33 0.77 0.53	0.11 0.54 0.64	0.11 0.43 0.10	0.33 0.72 0.46
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 32 SCIP Chem Roll 31 SCIP Bio Roll	0.03 0.11 0.12 0.72 0.80	0.00 0.01 0.01 0.52 0.64	0.00 0.01 0.00 0.51 0.12	-0.03 0.11 -0.08 0.72 0.46
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 32 SCIP Chem Roll 31 SCIP Bio Roll	0.03 0.11 0.12 0.35 0.73 0.80	0.00 0.01 0.01 0.12 0.54 0.65	0.00 0.01 0.00 0.11 0.42 0.11	-0.03 0.11 -0.08 0.33 0.72 0.46

Southeast (N \approx 363)

		riable No. 1 Abbrev.	Multiple R	Ř Square	RSQ Change	Simple P
All Variables Free	32	SCIP Chem Roll	0.80	0.63	0.63	0.90
Total Enroll. Forced	34 32	Tot Poll SCIP Chem Poll	0.47 0.81	0.22 0.65	0.22	0.47 0.80
School Type Forced	15 16 17 32	Type J-Sr Type Sr Type Jr SCIP Chem Roll	0.03 0.23 0.23 0.80	0.00 0.05 0.05 0.64	0.00 0.05 0.00 0.59	-0.03 0.21 -0.15 0.80
School Type & Total Enroll. Forced	15 16 17 34 32	Type J-Sr Type Sr Type Jr Tot Roll SCIP Chema Roll	0.03 0.23 0.23 0.49 0.41	0.00 0.05 0.05 0.24 0.66	0.00 0.05 0.00 0.19 0.42	-0.03 0.21 -0.18 0.47 0.80

All Regi	ions Combin	ed (N = 219	3)	
	Variable No. and Abbrev.	Multiple R R Square	RSQ Change	Simple R
All Variables Free	32 SCIP Chem Roll	0.57 0.33	0.33	0.57
Total Enroll. Forced	34 Tot Roll 32 SCIP Chem Roll	0.39 0.10 0.58 0.34	0.10	0.32 0.57
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 32 SCIP Chem Roll	0.09 0.01 0.24 0.06 0.24 0.05 0.58 0.34	0.01 0.05 0.00 0.28	-0.09 0.24 -0.19 0.57
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type S: 17 Type Jr 34 Tot Roll 32 SCIP Chem Roll	0.09 0.01 0.24 0.06 0.24 0.06 0.36 0.13 0.59 0.34	0.01 0.05 0.00 0.07 0.22	-0.09 0.24 -0.19 0.32 0.57

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TABLE 31

MEANS^a AND STANDARD DEVIATIONS FOR TEACHER PARTICIPATION IN NATIONAL SCIENCE FOUNDATION IN-SERVICE INSTITUTES

	Great Lakes	Farwest	New England	Mideast	Southwest	Rocky Mountains	Plains	Southeast	Total U.S.
Mean	0.39	0.51	0.65	0.72	0.38	0.62	0.62	0.42	0.52
S.D.	0.89	0.93	1.29	1.41	1.01	1.07	1.26	0.80	1.09
N	459	314	130	435	182	85	225	362	2192

TABLE 32

MEANS^a AND STANDARD DEVIATIONS FOR TEACHER PARTICIPATION IN NATIONAL SCIENCE FOUNDATION SUMMER INSTITUTES

Mean 1.29 1.42 1.61 1.13 1.19 1.07 1.20 0.89 S.D. 1.61 1.60 1.85 1.52 1.47 1.38 1.73	
N 459 314 130 435 182 85 225 362	1.20 1.52 2192

The participation in NSF In-Service Institutes ranged from a low of about 20 percent in the Southwest, Great Lakes, and Southeast regions to a high of about 35 percent in the Mideast. The participation in NSF Summer Institute Program ranged from a low of about 40 percent in the Southeast to a high of about 60 percent in the Farwest region. It can be seen that the frequency of participation in NSF sponsored institutes varies by region depending on the nature of the NSF program. To get a more general picture of the participation in NSF programs, the In-Service and Summer Institute variables were combined. A new variable, Teacher Participation in National Science Foundation Institutes, was produced. If a teacher reported participation in any NSF Institutes a one was recorded, otherwise a zero was recorded.

The means and standard deviations for Teacher Participation in National Science Foundation Institutes are given in Table 33. Participation in NSF Institutes ranged from 58 percent to 72 percent with the Farwest at the upper end. The participation across the country was quite uniform according to the data from these respondents.

TABLE 33

MEANS^a AND STANDARD DEVIATIONS FOR TEACHER PARTICIPATION IN NATIONAL SCIENCE FOUNDATION INSTITUTES

	Great Lukes	Farwest	New England	Mideart	Southwest	Rocky Mountains	Plains	Southenst	Total U.S
Melin S.D. N	0.62 0.49 459	0.72 0.45 314	0.68 0.47 130	0.62 0.49 435	0.58 0.49 182	0 . 69 0 . 46 85	0.48 225	0.58 0.49 362	0 - 63i 0 - 48i 2 1 9 2i
Ayes -	1, no = 0								



Variables were identified as correlates of NSF Institute participation if they were significantly correlated ($\alpha \le 0.001$) in at least four of the eight regions. The positive correlates were:

+Teacher's College Science Credits
+Age of Teacher
+Highest Degree Held by Teacher
+Secondary School Science Teaching Experience
+Teacher's College Physical Science and/or Mathematics Credits
+Sex of Teacher (2 = male, 1 = female)
+Total Student Enrollment
+Use of Science Course Improvement Projects

There were no negative correlates among the variables included in the study. From the positive correlates and the means in Table 2, p.9 it may be inferred that the participants in the NSF programs tend to be more experienced, higher educated, older males from larger schools with a tendency to focus on mathematics and the physical sciences. Not all of these characteristics are necessarily concurrent for participants but each characteristic is correlated.

The NSF Institute programs required that a teacher have a minimum of three years experience which may account for many of these correlates. The participation in these institutes also could contribute directly to credit hours and degrees and consequently to school size relationships. Teachers with more experience and more education tend to move "up" in the system to larger secondary schools.

The relationship of sex of the teacher to NSF participation is a reflection of the few women in science teaching at the secondary level. Whether or not those women in secondary school science teaching were discriminated against in selection of NSF Institute participants cannot be determined from these data.

The relationship between Use of Science Course Improvement Projects and NSF Institute participation is expected. Many institutes were designed to make people aware of the SCIP materials and train them in their use. Therefore, participants may have gone out to use the materials because of the institutes or they may have attended the institute in order to learn how to use programs and materials they had already selected.

It was also found that the participation in NSF Summer Institutes correlated significantly with participation in NSF In-Service Institutes. Teachers who applied and were selected for one of the NSF programs tended to apply and be selected for other NSF programs.

In the regression analyses, Tables 34, 35, and 36 the following results were obtained. The most predominate predictor of NSF Institute participation was the number of college science credits the science teachers reported. This variable was a significant predictor in all regions except the Mideast and Southeast. In these two regions, the Secondary School Science Teaching Experience in Years was the best predictor.



TABLE 34

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHER PARTICIPATION IN NATIONAL SCIENCE FOUNDATION IN-SERVICE INSTITUTES

Great I	Lakes (N =	459)				Midoast	(N = 433)				
	Variable No.	Mulciple R	R Square	RSQ Change	Simpl	1	Variable No.	Multiple	ĸ	RSQ	Simple
All Variable Free			0.06	0.06	0.24	All Variables		R 0.23	Square 0.05	0.05	0.23
Total Enroll Forced	. 34 Tot Roll	0.16	0.03	0.03	0.16		34 Tot Roll 78 Hra Sci	0.04 0.23	0.00	0.00	0.04
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr	0.09 0.13 0.13	0.01 0.02 0.02	0.01 0.01 0.00	-0.09 0.13 -0.07	School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr	0.05 0.12 0.13	0.00	0.00 0.01 0.00	-0.05 0.12 -0.09
School Type 8 Total Enroll Forced		0.09 0.11 0.13 0.18	0.06 0.01 0.02 0.02 0.03	0.05 0.01 0.01 0.00 0.01	0.24 -0.09 0.13 -0.07 0.15	School Type & Total Enroll. Porced		0.05 0.12 0.13 0.13	0.00 0.01 0.02 0.02	0.00 0.01 0.00 0.00	-0.05 0.12 -0.09 0.04
Farwest	(N ~ 309)				•	Southwes	t (N ~ 182)			
	Variable No.	Multiple R	R Square	RSQ Change	Simple		Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simpla R
All Variables Free	None	****				All Variables Free	26 Teach Sci 1 65 Admin Supp 76 Hrs Earth	M 0.32 0.41 0.47	0.10 0.17 0.22	0.10 0.07 0.05	0.32 -0.28 0.25
Total Enroll. Forced School Type	34 Fot Roll 15 Type J-Sr	0.03	0.00	0.00	0.15	Total Enroll. Porced	34 Tot Rell 26 Teach Set 9 65 Admin Supp	0.18 0.32 0.41	9.03 9.10 9.17	0.03	0.18 0.32 -0.28
Forced	16 Type Sr 17 Type Jr	9.15 0.22	0.02	0.00	-0.05	School Type	76 Hrm Earth 15 Type J-Sr	0.47	0.22	0.05	0.25
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type br 17 Type Jr 34 Tot Roll	0.15 0.15 0.22 0.22	0.02 0.03 0.05 0.05	0.02	0.15 -0.65 -0.35 -0.35	Forced	10 Type Sr 17 Type Jr 26 Teach Sci M 70 Hre Earth 65 Admin Supp	0.15 0.15 0.45 0.43 0.49	0.02 0.02 0.12 0.18 0.24	0.02 0.00 0.10 0.06 0.05	0.08 +0.12 -0.32 -0.25 -0.28
						School Type & Total Entoll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tor Roll 76 Hrs Earth 26 Teach Sci 4 65 Admin Supp 08 Roll Bio	0.07 0.15 0.15 0.24 0.34 0.43 0.49	0.01 0.02 0.05 0.05 0.13 0.19 0.24 0.29	0.01 0.02 0.00 0.04 0.07 0.06 0.05	0.07 0.08 -0.12 0.18 0.25 0.32 -0.28 -0.01
New Engl	and (N = 1	30)			-	Rocky Mou	mtains (N	= 85)			
	Variable No. and Abbrev.	Multiple R S		PSQ Th a nge	Simple R		Variable No. and Abbrev.	Mulcipla R S	R iquare	RSO Cliange	Simple S
Free Total Enroll. Forced	30 SCIP ES Roll 80 SCIP Chem TE 34 Tot Roll 36 SCIP ES Roll	0.52 0.25 0.45	0.27 0.06 0.21	0.19 0.67 0.06 0.14	0.44 9.34 0.25 0.44	free	78 Hrs Sci 59 Writ Assign 65 Admin Supp 44 Slide Proj 51 Ind Study		0.07 0.16 0.22 0.29 0.35	0.07 0.09 0.06 0.07 0.06	0.27 0.25 0.26 9.26 9.21
School Type Porced	80 SCIP Chem TE 15 Type J-Sr 16 Type Sr 17 Type Jr 30 SCIP ES Roll 80 SCIP Chem TE	0.12 0 0.14 0 0.14 0 0.49 0	0.01 0.02 0.02 0.02	0.00 0.00 0.22	0.12 0.12 0.05 0.05 0.44 0.44 0.44	Forced	14 Tor Roll 78 Hrm Sc! 68 Inservice 44 Slide Proj 51 Ind Stody	7, 30 9,42 0,48	0.09 0.18 0.23	0.01 0.08 0.08 0.06 0.07	-0.08 0.27 0.25 0.26 0.23
School Type & Total Enroll Forced		0.12 0 0.11 0 0.14 0 0.28 0	0.01 (0.02 (0.02 (0.05 (0.25 (0.01 - 0.00).56).75		Porqui	15 Type J-Sr 16 Type Sr 17 Type Ir 78 Brs Sct 91 Grouping 511de Proj	0.24 9.41 0.49 8.55	0.06 0.17 0.24 1.59		-0.29 -0.06 -0.05 -0.21 -0.24 -0.26
•	222 31144 11	,			-	'orc#d 1 1 7 0	1: type f Sr 16 type br 17 Type Jr 34 Tot Roll 78 Hrw Sci 11 Grouping 44 Slide Proj	0.41 0 0.42 0 0.50 0 0.56 0	1.0), 0.17 (0.18 (0.25 (0.31 (9.62 0.11 0.00 - 0.07	9,20 0.05 0.05 0.08 0.27 0.21 0.26



TABLE 34 Continued

TUDDE 24		LInueu				·····
Plains (N ≃	225)				
		mble No. Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	74 1	irs Bio	0.26	0.07	0.07	0.26
Total Enroll. Forced		Tot Roll	0.03	0.00	0.00	0.03
rotted	/4 t	irs Bio	0.26	0.07	0.07	0.26
School Type	15 T	ype J-Sr	0.04	0.00	0.00	0.04
Forced		ype Sr	0.07	0.00	0.00	-0.07
	17 T	ype Jr	0.10	0.01	0.01	0.05
	/0 H	irs Sci	0.29	0.09	0.08	0.26
School Type &	15 T	ype J-Sr	0.04	0.00	0.00	0.04
Total Enroll.		ype Sr	0.07	0.00	0.00	-0.07
Porced	17 T	ype Jr	0.10	0.01	0.01	0.05
		ot Roll	0.11	0.01	0.00	0.03
	78 H	re Sci	0.29	0.09	0.07	0.26
Southers	- (N	~ 363)				
	Verie	ble No.	Multiple	R	RSQ	Simple
		bbrev.	B	Square		
All Variables Free	42 T	aught Sci	0.25	0.06	0.06	0.25
Total Enroll.	34 T	ot Roll	0.01	0.00	0.00	0.01
Forced		aught Sci	0.25	0.06	0.06	0.25
School Type	15 T	ype J-Sr	0.04	0.00	0.00	0.04
Porced	16 T	ype Sr	0.05	0.00	0.00	-0.05
		ype Jr	0.09	0.01	0.01	-0.03
	42 T	aught Sci	0.27	0.07	0.06	0.25
School Type &	15 T	ype J-Sr	0.04	0.00	0.00	0.04
Total Enroll.		ype Sr	0.05	0.00	0.00	-0.05
Forced	17 T	ype Jr	0.09	0.01	0.01	-0.03
		ot Roll	0.10	0.01	0.00	0.01
	42 T	aught Sci	0.27	0.07	0.06	0.25
All Regio	ns (Combined	(N ≃	219 2)		
	Verie	ble No.	Miltible	R	RSQ	Simple
		bbrev.	R	Square	Change	
All Variables Free	None		****			
Total Enroll. Forced	34 To	ot Roll	0.07	•	0.01	0.07
School Type	15 Ty	pe J-Sr	11	0.00	0.00	-0.01
Forced		pe Sr	Ú -)	0.00	0.00	0.03
	17 Ty	pe Jr	Ü. J4	0.00	0.00	-0.03
School Type &	15 Ty	pe .I-Sr	0.01	0.00	0.00	-0.01
Total Enroll.	16 Ty	pe Sr	0.03	0.00	0.00	0.03
Forced	17 Ty	pa Jr	0.04	0.00	0.00	-0.03
	34 To	t Roll	0.08	0.01	0.00	0.07



SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHER PARTICIPATION IN NATIONAL SCIENCE FOUNDATION SUMMER INSTITUTES

Great I	ake	≥s (N ≃ /	459)				Mideast	(N	433)				
		eriable No. nd Abbrev.	Multiple R	R Square	RSQ Change	Simple R	•		Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Stmp1
Ali Variable Free	s 7	5 Hrs Phy Sc:	0.31	0.09	0.09	0.31	All Variable Free	:н /	78 Bre Sci	0.35	0.12	0.12	0.35
Total Enroll Forced	. 34		0, 19 0, 34	0.04 0.11	0.04	0.19 0.31	Total Enroll Forced		Hrs Sci	0.01	0.00	0.00	-0.01 0.35
School Type Forced	16	Type Jr	0.06 0.11 0.11 0.31	0.00 0.01 0.01 0.10	0.00 0.01 0.00 0.08	-0.06 0.11 -0.08 0.11	School Type Forced	1 1	5 Type J-Sr 6 Type Sr 7 Type Jr 8 Hre Sct	0.03 0.06 0.08 0.35	0.00 0.00 0.01 0.12	0.00 0.00 0.00 0.12	0.03 0.04 -0.03 0.35
School Type (Total Enroll: Forced	. 16 17 34		0.06 0.11 0.11 0.20 0.34	0.00 0.01 0.01 0.04 0.11	0.00 0.01 0.00 0.03 0.03	-0.06 0.11 ~0.08 0.19 0.31	School Type Total Enroll Forced	. 1 1 3	5 Type Sr	0.01 0.06 0.08 0.08 0.36	0.00 0.00 0.01 0.01 0.13	0,00 0,00 0,00 0,00 0,12	0.03 0.04 -0.03 -0.01 0.35
Farwest	(N	~ 309)					Southwes	 L ((N = 182)				
		riable No. i Abbrev.	Multiple R	r Square	RSQ Change	Simple R			eriable No.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	75	Hra Thy Sci	0.14	0.11	0,11	0.34	All Variables Free		Taught Scl Hru Scl	0.43	0.18 0.24	0.18	0.43
Total Enroll. Forced	75	Tot Roll Hrs Phy Sel	0.06 0.34	0.00 0.12	0.00 0.11	-0.06 0.34	Total Enroll. Forced	4.2	Tot Roll Taught Sci Hra Sci	0.06 0.43 0.50	0.00 0.18 0.25	0.00 0.18 0.07	0.06 0.41 0.19
School Type Forced	15 16 17 77	Type J-Sr Type Sr Type Jr Hre Math	0.09 0.15 0.19 0.37	0.01 0.02 0.03 0.14	0.01 0.01 0.01 0.10	-0.09 0.14 -0.14 0.32	School Type Forced	15 16 17 42	Type Sr Type Jr	0.05 0.14 0.14 0.44	0.00 0.02 0.02	0,00 0,02 0,00	0.05 0.09 -0.14
School Type & Total Enroll. Forced	16 17 34	Type Jr	0.09 0.15 0.19 0.22 0.38	0.01 0.02 0.03 0.05 0.14	0.01 0.01 0.01 0.01 0.10	-0.09 0.14 -0.14 -0.06 0.32	School Type & Total Enroll. Forced	78 15 16 17	Hrm Sci Type J-Sr Type Sr	0.05 0.05 0.14 0.14	0.19 0.25 0.00 6.02 0.02	0.17 0.06 0.00 0.02 0.00	0.43 0.39 0.05 0.09 -0.16
								42 78	Taught Sci	0.15 6.44 0.50	0.02 0.19 0.25	0.00 0.17 0.0h	0.06 0.43 0.39
New Engl	and	(N ≈ 13	10)				Rocky Mou	ın ta	ains (N ≃	85)			
		able No. Abbrev.	Multiple R	R Square	RSQ Change	imple P			fiabla No. Abbray.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free			0.55	0.31	0.31		All Variables Pree	80 66	SCIP Chem TE Sci Fac	0.43 0.52 0.58	0.19 0.27 0.34	0.19 0.08 0.07	0.43 0.43 0.26
Total Enroll. Forced		Tot Roll Hra Sci	0.08 0.56	0.01	0.01	0.08	Total Enroll.		Tot Roll	0.63	0.04	0.05	-0.21 -0.28
	16 17	Type J-Sr Type Sr Type Jr Hra Sci	0.15 0.15 0.15 0.57	0.02 0.02 0.07 0.13	0,02 0,00 0.00 0.11	0.12 0.00 0.55	Forced School Type	66 70	SCIP Chem IE Sci Fac Small Clamaes	0.47 0.56 0.60	0.22 0.10 0.36		0.43 0.26 -0.21
Total Enroll. Porced	16 17 34	Type J-Sr Type Sr Type Jr Fot Roll Hrm Sci	0.16 0.17	0.02 0.02 0.03 0.03	0.02 9.00 0.00 0.00 0.10		orced Type	15 17 80 08 66	Type J-Sr Type Sr Type Jr SCIP Chem IE Roll Bio Sci Far Small Classes	0.30 0.46 1.54 0.59	0.21 0.29 0.35	0.12 0.67 3.06	0.01 0.27 0.29 0.41 1.43 0.26 0.21
						T	otal Enroll. Orned	17 34 80 66	Type 1-Sr tipe 5r Type fr Tot Roll SC12 Chom TE Sci Fac Small Classes	0.29 0.13 0.37 0.50 0.56	0.09 0.00 0.14 0.25 0.32	0.00 0.04 0.05 0.11 0.07	0.01 0.27 0.29 0.28 0.43 0.26



TABLE 35 Continued

Plains (N =	= 225)				· · · · · · · · · · · · · · · · · · ·
		riable No. d Abbrav.	Multiple R	R Square	RSQ Change	Simple R
All Variables		Hrs Sci	0.34	0.11	0.11	0.34
Frac	15	Type J-Sr	0.40	0.16	0.05	-0.23
Total Envoll.			0.23	0.05	0.05	0.23
Forced	78	Hrs Sci	0.37	0.14	0.09	0.34
School Type	15	Type J-Sr	0.23	0.05	0.05	-0.23
Forced	16	Typa Sr	0.27	0.07	0.02	0.24
	17	Type Jr	0.28	0.08	0.01	-0.06
	78	Hrs Sci	0.42	0.17	0.09	0.34
School Type &			0.23	0.05	0.05	-0.23
Total Enroll.	16		0.27	0.07	0.02	0.24
Forced		Type Jr	0.28	0.08	0.01	-0.06
	34 78		0.33 0.43	0.11 0.18	0.03	0.23
	/0	HLW 2CT	0.43	0.10	0.08	0.34
Southeast	: ($N \simeq 363)$				
		riable No.	Multiple	R	RSQ	Simple
	end	i Abbrev.	R	Square	Change	R
All Variables	78	Hrs Sci	0.29	0.08	0.08	0.29
Free	36	Age	0.38	0.14	0.06	0.29
Total Enroll.	34	Tot Roll	0.14	0.02	0.02	0.14
Porced	36	Age	0.31	0.09	0.08	0.29
		Hrs Sci	0.38	0.15	0.05	0.29
School Type	15	Type J-Sr	ú. 09	0.01	0.01	0.09
Forced	16	Type Sr	0.18	0.03	0.03	0.10
	17	Type Jr	0.19	0.04	0.00	-0.17
	36	Age	0.34	0.11	0.08	0.29
	78	Hrs Sci	0.41	0.16	0.05	0.29
School Type &	15	Type J-Sr	0.09	0.01	0.01	0.09
Total Enroll.	16	Type Sr	0.18	0.03	0.03	0.10
Forced	17	Type Sr Type Jr	0.19	0.04	0.00	-0.17
	34	Tot Roll	0.22	0.05	0.01	0.14
	36	Age	0.35	0.12	0.07	0.29
All Regio	ns	Combine	d (N ≃	2192)		
	Var	iable No.	Multiple	R	RSQ	Simple
		Abbrev.	R	Square		
All Variables	7.8	Hrs Sci	0.33	0.11	0.11	0.33
Free	7.0	nts JCI	0. 33	0.11	0.11	0.33
Total Enroll.	34	Tot Roll	0.11	0.01	0.01	0.11
Forced	78	Hre Sci	0.33	0.11	0.10	0.33
School Type	15	Type J-Sr	0.05	0.00	0.00	-0.05
Forced	16	Type Sr	0.14	0.02	0.02	0.14
	17	Type Jr	0.14	0.02	0.00	-0.11
	78	Hrs Sci	0.34	0.12	0.10	0.33
School Type &	15	Type J-Sr	0.05	0.00	0.00	-0.05
Total Enroll.		Type Sr	0.14	0.02	0.02	0.14
Porced	17	Type Jr	0.14	0.02	0.00	-0.11
	34	Tot Roll	0.16	0.03	0.00	0.11
	78	Hrs Sci	0.34	0.12	0.09	0.33



TABLE 36

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHER PARTICIPATION IN NATIONAL SCIENCE FOUNDATION INSTITUTES

Great L	akes (N ≃ 4	59)				Mideast	(.)	1 ~ 433)				
	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R	•		arieble No nd Abbrev	Multiple R	R Square	RSQ Change	Simple R
All Variable Free	38 Degree Held 78 Hrs Sci	0.15 0.41	0.12 0.17	0.12	0.35 0.34	All Variables	s 4;	2 Taught Sci	0 30	0 09	0.09	J. 30
Total Enroll Forced	. 34 Tot Roll 38 Degree Held	0.20 9.37	0.04 0.14	0.04 0.10	0.20 0.35	Total Enroll. Porced	. 34 41		0.03 0.30	0.00 0.04	0.00	0.03 0.30
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 38 Degree Held	0.08 0.16 0.17 0.38	0.01 0.02 0.03 0.14	0.01 0.02 0.01 0.11	-0.08 0.16 -0.08 0.35	School Type Forced	15 16 17 42	Type Sr	0.05 0.13 0.15 0.33	0.00 0.02 0.02 0.11	0.00 10.01 0.01 80.0	-0.05 0.13 -0.05 0.30
School Type of Total Enroll Forced		0.08 0.16 0.17 0.23 0.39	0.01 0.02 0.03 0.05 0.15	0.01 0.02 0.01 0.02 0.10	-0.08 0.16 -0.08 0.20 0.35	School Type & Total Throit. Force	16 17 34	Type Sr Type Jr	0.75 0 13 0.15 0.15 0.33	0.00 0.02 0.02 0.02 0.11	0.01 0.01 0.01 0.00 0.00	-0.05 0.13 -0.05 0.03 n.30
<u> </u>	(N ~ 309)					Southwes		(N ≈ 182)			·	
	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R		٧a	riable No. d Abbrev.	Multiple #	R Square	880 Changa	Simpla R
All Variables Free	75 H., thy Sct. 76 Hrs Earth	0.32 0.39	0.10	0.15 0.05	0.12 0.23	All Variables Free		Are	0.3h 0.44	0.13 0.20	0.13 9.07	0.36 0.34
Total Enroll. Forced	34 Tot Roll 75 Hrs Phy Sci 76 Hrs Earth	0.02 0.32 0.39	0.00 0.11 0.16	0 00 0.10 0.05	0.02 0.32 0.23	Total Enroll. Forced	34 36 78		0.01 0.36 0.46	0.00 0.13 0.21	0.00 0.13 0.08	0.01 0.16 0.34
School Type Forced	15 Type I-Sr 16 Type Sr 17 Type Jr 75 Hrs Phy Sct 76 Hrs Earth	0.07 6.12 6.15 0.34 0.41	0 00 0.01 0.03 0.12 0.17	0.00 0.01 0.01 0.09 0. 05	-0.07 0.11 -0.12 0.32 0.23	School Type Porced	15 16 17 36 78	Type J-Sr Type Sr Type Jr Age Hra Scl	0.04 0.13 0.14 0.37 0.45	0.00 0.02 0.02 0.14 0.20	0.00 0.02 0.00 0.12 0.06	0.04 0.10 -0.14 0.36 0.36
School Type & Total Enroll. Porced		0.07 0.12 0.16 0.16 0.34	9.00 0.01 0.03 0.12 0.17	0.00 0.01 0.01 0.00 0.09 0.05	-0.07 0.11 -0.12 0.02 0.32 0.23	School Type & Total Enroll. Forced		Type J-Sc Type Sr Type Jr Tot Roll Age Hrs Sci Lecture	0.04 0.13 0.14 0.14 0.38 0.46	0.00 0.02 0.02 0.02 0.02 0.14 0.21	0.00 0.02 0.60 0.00 0.12 0.07 0.05	0.04 0.10 -0.14 0.01 0.36 0.34 -0.24
New Engl	and (N = 13	0)				Rocky Mot	ın.t	ains (N	85)			
	Variable No. and Abbrev.	Hultiple R S	R Square	RSO Change	Simple			iabla No. Abbrev.	Hultiple R	R Square	RSQ Change	Simple R
il Vertables ree	78 Hrs Sci 10 Roll Physics	0.33	0.11 0.20	0.11	0.13 30	All Varisbles Free	:8	Hra Sci Admin Supp	0.28 0.35	0.08	0.08 0.05	0.28 0.23
otal Enroll. otc⇒d	34 Tot Roll 78 Hrs Sci 10 Roll Physics	0.36	0.02 0.13 0.20	0.02 0.11 0.67	0.12 0.13 0.30	Total Enroll Porced	78 65	For Roll Fra Sel Admin Supp	0 09 0.28 0.35	0.01 0.08 0.12	0.01 0.07 0.05	0.09 0.28 0.23
chool lype orcad	15 Type J-Sr 16 Type Sr 17 Type Jr 78 Hrs Sci 10 Roll Physics	0.21 0.22 0.19 0.47	0.04 0.04 0.05 0.15 0.22	0.04 0.00 0.01 0.10 0.07	-5.20 0.17 -0.05 0.33 0.30	School Type Forced	ስነ	Type J-Sr Type Sr Type Jr SCIP Earth TE Admin Supp Hrw Phy Sci	0.19 0.24 0.24 0.35 0.42 0.47	0.03 0.06 0.06 0.12 0.17 0.22	0.02	-0.19 -0.19 -0.07 -0.21 -0.21 -0.22
otal Type A otal Enroll, orced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Rol. 78 Hrs Sci 10 Roll Physics	0,21 0,27 0,24 0,40	0.06 0.16	0.04 0.00 0.01 0.01 0.10 0.05	0.17 0.17 0.05 0.12 0.31 0.39	Total Enrol: Forcad	15 16 17 34 81 65	Type J Sr Type St Type Jt Tot Roll SCIP Earth TZ Admin Supp Hrs Phy Sci	0 19 0 24 0 24 0 26 0 35 0 42 0 47	0.03 0.06 0.06 0.06 0.06 0.12	0.01 0.02 0.00 0.00 0.07 0.07	0.19 0.19 0.07 0.07 0.09 0.21 0.23 0.22



TABLE 36 Continued

TABLE 3	b Continued				
Plains ($(N \simeq 225)$				
	Variable No. and Abbrev.	Multiple R	R Square	RS Q Change	Simple R
All Variables Free	18 SCIP Use 78 Hrs Sci	0.36 0.43	0.13 0.19	0.13 0.06	0.36 0.34
Total Enroll. Forced	34 Tot Roll 18 SCIP Use 78 Hrs Sci	0.13 0.36 0.43	0.02 0.13 0.19	0.02 0.11 0.06	0.13 0.36 0.34
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 18 SCIP Use 78 Hrs Sci	0.10 0.14 0.18 0.39 0.45	0.01 0.02 0.03 0.15 0.21	0.01 0.01 0.01 0.12 0.05	-0.10 0.13 -0.07 0.36 0.34
School Type & Total Enroll. Forced	Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 18 SCIP Use 78 Hrs Sci	0.10 0.14 0.18 0.21 0.39 0.45	0.01 0.02 0.03 0.04 0.15 0.21	0.01 0.01 0.01 0.01 0.11 0.05	-0.10 0.13 -0.07 0.13 0.36 0.34
Southeas	t (N ~ 363)				
	Verisble No. and Abbrev.	Muitiple R	R Square	RSQ Change	Simple R
All variables Pree	42 Taught Sci	0.36	0.13	0.13	0.36
Total Enroll. Forced	34 Tot Roll 42 Taught Sci	0.19 0.39	0.04 0.16	0.04 0.12	0.19 0.36
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 42 Taught Sci	0.05 0.14 0.15 0.38	0.00 0.02 0.02 0.14	0.00 0.02 0.00 0.12	0.05 0.09 -0.14 0.36
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 42 Teught Sci	0.05 0.14 0.15 0.23 0.41	0.00 0.02 0.02 0.05 0.17	0.00 0.02 0.00 0.03 0.11	0.05 0.09 -0.14 0.19 0.36
All Regio	ons Combine	d (N ≃	2192)		
	Variable No. and Abbrev.	Multiple R	R Squara	RSQ Change	Simple R
All Variables Free	78 Hrs Sci 42 Taught Sci	C.30 0.37	0.09 0.14	0.09	0.30 0.29
Total Enroll. Porced	34 Tot Roll 78 Hrs Sci	0.12	0.01 0.09	0.01	0.12 0.30
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 78 Hrs Sci	0.06 0.13 0.17 0.31	0.00 0.02 0.02 0.10	0.00 0.01 0.00 0.08	-0.06 0.13 -0.10 0.30
School Type & Total Enroll. Forcad	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 78 Hrs Sci	0.06 0.13 0.13 0.15 0.31	0.60 0.02 0.02 0.02 0.10	0.00 0.01 0.00 0.01 0.07	-0.06 0.13 -0.10 0.12 0.30



The relationship between NSF Institute participation and college credits in science was eliminated in the Great Lakes region when Total Student Enrollment and/or School Type were forced or partialled out of these variables during stepwise regression analysis.

This could indicate that the correlation between NSF Institute participation and college science credits in the Great Lakes region was reflecting the tendency for NSF participants to be teachers in high schools, which tend to be larger than junior high schools, rather than just the fact that the participants have more hours of science. In fact the best predictor of NSF Institute participation in the Great Lakes was the Highest Degree Held by the Teachers. This relationship was not changed by partialling out School Type or Total Student Enrollment. It would appear that those teachers in this region that tend to pursue advanced degrees also participated in the NSF program. Perhaps the NSF Institute Program and the Degree Granted Program of the colleges and universities holding these institutes were coordinated.

Homogeneous Grouping in Science Classes

The principals were asked if the science classes were grouped homogeneously in their school. If they said yes, a two was recorded; if no, a one was recorded. The means and standard deviations for this variable are given in Table 37. The use of grouping ranges from a low of 65 percent in the Plains region to 90 percent in New England.

TABLE 37

MEANS^a AND STANDARD DEVIATIONS FOR HOMOGENEOUS GROUPING IN SCIENCE CLASSES

	Great Lakes	Farvest	New Forland	Middenst	Southwest	Rocky Mountains	Plains	Nontheast	Total U.S
Mean S.D. N	1.53 9.50 433	1.47 0.50 305	1.80 0.40 129	1.70 0.46 -31	1.47 0.50 182	1.41 0.49 83	1.30 0.46 221	1.49 G.50 353	1.50 0.50 215d
ayes =	2, ne - 1								

One variable, Total Student Enrollment, had a significant positive correlation with Homogeneous Grouping in Science Classes. The correlation of these two variables was significant at the (a \leq 0.001) level in four of the eight regions. The larger schools tend to group their students for science more than do smaller schools.

In the Southwest region the Use of Local Consultants was the best predictor of grouping and in the Rocky Mountains region the Teacher Ranking of Administrative Support as Important for High Quality Science Program was the best predictor. These variables accounted for 5 to 10 percent of the variance in their respective regions. These results are given in Table 38.



TABLE 38

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF HOMOGENEOUS GROUPING IN SCIENCE CLASSES

Great L	akes (N	~ 459)				Mideast	(N	~ 433)				
	Veriable N and Abbrev		R Squera	RSQ Change	Simple R			risbla No. d Abbrev.	E i ipla R	R Squere	RSQ Chunge	Simple R
All Variables Free	08 Roll B	la 0.29	0.08	0.08	0.29	All Variables	No	ne				
Total Enroll. Forced	34 Tot Ro	0.24	0.06	0.06	0.24	Total Enroll.	34	Tot Roll	0.05	0.00	0.00	0.05
School Type Forced	15 Type J- 16 Type S: 17 Type J: 08 Roil B:	0.17 0.17	0.03 0.03 0.03 0.10	0.03 0.00 0.00 0.07	-0.17 C.12 0.00 0.29	School Type Forced	15 16 17		0.03 0.11 6.11	0.00 0.01 0.01	0.00 0.01 0.00	-0.03 -0.08 0.11
School Type .& Total Enroll. Forced	15 Type J- 16 Type Sr 17 Type Jr 34 Tot Rol	0.17 0.17	0.03 0.03 0.03 0.07	0.03 0.00 0.00 0.04	-0.17 0.12 0.00 0.24	School Type & Total Enroll. Forcad			0.03 0.11 0.11 0.13	0.00 0.01 0.01 0.02	0.00 0.01 0.00 0.01	-0.03 -0.08 0.11 0.05
Farwest	(N ≃ 30	9)				Southwest	(N = 182)				
	Veriable No and Abbrev.	. Multiple R	R Square	RSQ Change	Simple R			iabla No. LAbbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	34 Tot Rol	1 0.25	0.06	0.06	0.25	All Variables Free	22	Local Cons	0.23	0.05	0.05	0.23
Total Enroll. Forced	34 Tot Rol	0.25	0.06	0.06	0.25	Total Enroll. Forced	34 22	Tot Roll Local Cons	0.20 0.30	0.04	0.04	0.20
School Type Forced .	15 Type J- 16 Type Sr 17 Type Jr 34 Tot Rol	0.02	0.00 0.00 0.01 0.07	0.00 0.00 0.00 0.07	0.01 0.02 0.00 0.25	School Type Porced	15 16 17 22	Type J-Sr Type Sr Type Jr Local Cons	0.15 0.16 0.17 0.29	0.02 0.02 0.03 0.08	0.02 0.00 0.00 0.06	-0.15 0.02 0.08 0.23
School Type & Total Enroll. Forced	15 Type J-9 16 Type Sr 17 Type Jr 34 Tot Roll	0.02 0. 07	0.00 0.00 0.01 0.07	0.00 0.00 0.00 0.07	0.01 0.02 0.00 0.25	School Type 6 Total Enroll. Forced	15 16 17 34 22	Type J-Sr Type Sr Type Jr Tot Roll Local Cone	0.15 0.16 0.17 0.24 0.33	0.02 0.02 0.03 0.06 0.11	0.02 0.00 0.00 0.03 0.05	-0.15 0.02 0.08 0.20 0.23
New Engl	and (N	≃ 130)			-	Rocky Mou	nta	nins (N ≃	85)			
	Variable No and Abbrev.	. Multiple R	R Square	RSQ Change	Simple R			iable No. Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Veriables Pres	None					All Variables Free	06	Admin Supp Roll GS	0. 28 0.37	0.08	0.08	0.28
Total Enroll. Porced	34 Tot Rol	0.11	0.01	0.01	0.11			Teach Sof M Ind Study	0.44	0.19 0.24	0.06	0.23
School Type Forced	15 Type J-S 16 Type Sr 17 Type Jr	0.05 0.06 0.07	0.00 0.00 0.0i)	0.00 0.00 0.00	-0.05 0.01 0.02	Total Enroll. Forced	65 26	Tot Roll Admin Supp Teach Sci H Roll GS	0.09 0.29 0.38 0.46	0.01 0.08 0.14 0.22	0.01 0.07 0.06 0.07	0.09 0.28 0.23 0.25
School Type & Total Enroll. Porced	15 Type J-S 16 Type Sr 17 Type Jr 34 Tot Roll	0.06 0.07	0.00 0.00 0.00 0.02	0.00 0.00 0.00 0.01	-0.05 0.01 0.02 0.11		16 17 65 06	Type J-Sr Type Sr Type Jr Admin Supp Roll GS Ind Study	0.13 0.13 0.22 0.36 0.45 0.52	0.02 0.02 0.05 0.13 0.20 0.27	0.02 0.00 0.03 0.08 0.07	-0.13 0.05 0.09 0.28 0.25 0.25
					İ	Forced	16 17 34 65 06	Type J-Sr Type Sr Type Jr Type Jr Tot Roll Admin Supp Roll GS Ind Study		0.02 0.02 0.05 0.05 0.13 0.20	0.02 0.00 0.03 0.00 0.08 0.07	0.13 0.05 0.09 0.09 0.28 0.25
												



TABLE 38 Continued Plains (N \approx 225)

		,				
		riable No. d Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	Not	ne				
Total Enroll. Forced	34	Tot Roll	0.10	C.01	0.01	0.10
School Type Forced	15 16 17	Type J-Sr Type Sr Type Jr	0.08 0.10 0.11	0.01 0.01 0.01	0.01 0.00 0.00	-0.08 -0.01 0.09
School Type & Total Enroll. Forced	15 16 17 34	Type J-Sr Type Sr Type Jr Tot Roll	0.08 0.10 0.11 0.13	0.01 0.01 0.01 0.02	0.01 0.00 0.00 0.01	-0.08 -0.01 0.09 0.10

Southeast	t ($N \approx 363$				
		riable No. I Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	34	Tot Roll	0.22	0.05	0.05	0.22
Total Enroll. Forced	34	Tot Roll	0.22	0.05	0.05	0.22
School Type Forced	15 16 17 08	Type J-Sr Type Sr Type Jr Roll Bio	0.07 0.08 0.11 0.25	0.00 0.01 0.01 0.36	0.00 0.00 0.01 0.05	-0.07 0.00 0.09 0.17
School Type & Total Enfoll. Forced	15 16 17 34	Type J-Sr Type Sr Type Jr Tot Roll	0.07 0.08 0.11 0.24	0.00 0.01 0.01 0.06	0.00 0.00 0.01 0.05	-0.07 0.00 0.09 0.22

		riabla No. i Abbrev.	Multiple R	R Square	RSQ Change	5impl∉ R
All Variables Free	28	Teach Sci	0.23	0.05	0.05	0.23
Total Enroll. Forced	34	Tot Roll	0.19	0.04	0.04	0.19
School Type Forced	15 16 17 28	Type J-Sr Type Sr Type Jr Teach Sci	0.09 0.09 0.10 0.25	0.01 0.01 0.01 0.06	0.01 0.00 0.00 0.05	-0.09 0.04 0.04 0.23
School Type & Total Enroll. Forced	15 16 17 34	Type J-Sr Type Sr Type Jr Tot Roll	0.09 0.09 0.10 0.21	0.01 0.01 0.01 0.04	0.01 0.00 0.00 0.01	-0.09 '0.04 0.04 0.19



Teacher Rankings of Importance of Learning Activities

The teachers were asked to rank learning activities according to their importance in secondary science courses. The activities included were

Lecture
Lecture-Discussion
Small Group Discussion
Science Demonstrations
Instructional Films
Independent Study
Individual Laboratory Activity
Group Laboratory Activity
In-Class Written Assignments
Excursions or Field Studies
Programmed Instruction
Auto-tutorial Instruction
Televised Instruction

From these learning activities the rankings for six were chosen for further analysis. These were

Lecture
Lecture-Discussion
Science Demonstrations
Instructional Films
Individual Laboratory Activity
Group Laboratory Activity

These were chosen on the bases of the rankings obtained from the teachers. The teachers were asked to rank the activity as "most often used," "2nd most often used," "3rd most often used," "used," or "not used." If a learning activity was marked "used" or "not used" by 85 percent or more of the teachers, it was not considered for further analysis. This means that all learning activities ranked in the top three by at least 15 percent of the teachers were chosen for further analyses. The means and standard deviations for the Teacher Rankings of Lecture, Lecture Discussion, Science Demonstration, Instructional Films, Individual Laboratory, and Group Laboratory as Important Learning Activities are given in Tables 39, 40, 41, 42, 43, and 44.

TABLE 39

MEANS AND STANDARD DEVIATIONS FOR TEACHER RANKING OF LECTURE
AS IMPORTANT LEARNING ACTIVITY

	Grent Lakes	Farwest	New England	Mideast	Southwest	Rucky Mountains	Plains	Southeast	iotal U.S
	Great Lakes	ratwest	wea ruktand	MIGERS	SOUTHWENC	Flount Ains	Flains	Southeast	intai 0.3
Mean	1.07	0.73	1.13	0.88	1.12	0.69	0.75	0.83	0.90
S.D.	1.30	0.98	1.41	1.21	1.34	0.98	1.04	1.15	1.20
N	459	313	1 10	4 3 4	182	85	224	362	2189



MEANS^a AND STANDARD DEVIATIONS FOR TEACHER RANKING OF LECTURE-DISCUSSION AS IMPORTANT LEARNING ACTIVITY

	Great Lakes	Forvest	New England	MI deas t	Southwest	Rocky Hountains	Plains	Southeast	Total U.S
lean i.D.	3.09 1.27 459	3.11 1.19 313	3.02 1.31 130	3.14 1.27 434	2.97 1.34 182	2.79 1.36 85	2.92 1.40 224	3.12 1.31 362	3.06 1.29 2189

TABLE 41

MEANS^a AND STANDARD DEVIATIONS FOR TEACHER RANKING OF SCIENCE DEMONSTRATIONS
AS IMPORTANT LEARNING ACTIVITY

	Great Lakes	Farwest	New England	Mideast	Southwest	Rocky Mountains	Platns	Southeast	Total U.S
Mean	1.17	1.11	1.31	1.55	1.23	1.26	1.10	1.33	1.27
S.D.	1.05	0.91	0.99	1.16	0.95	1.11	0.99	1.08	1.05
N	459	311	130	414	182	85	224	362	2189

MEANS^a AND STANDARD DEVIATIONS FOR TEACHER RANKING OF INSTRUCTIONAL FILMS
AS IMPORTANT LEARNING ACTIVITY

	Great Lakes	Farwest	New England	Hidenat	Southwest	Rocky Mountains	Plains	Southeast	Total U.S.
Mean	1.03	1.08	0.78	0.94	0.95	0.85	0.98	1.19	1.02
S.D.	0.84	0.80	0.76	0.80	0.79	0.68	0.80	0.95	0.83
N	459	313	130	414	182	85	274	362	2189

TABLE 43

MEANS AND STANDARD DEVIATIONS FOR TEACHER RANKING OF INDIVIDUAL LABORATORY
ACTIVITY AS IMPORTANT LEARNING ACTIVITY

	Great Lakes	farvest	New England	Mideast	Southwest	Rocky Mountains	Platna	Southeant	Tital U.S.
Mean	1.59	1.49	1.28	1.36	1,46	1.60	1.44	1.03	1. 39.
S.D.	1.44	1.45	1.37	1.35	1.42	1.49	1.38	1.28	1.40
N	459	313	130	434	182	85	224	367	2189



TABLE 44

MEANS^a AND STANDARD DEVIATIONS FOR TEACHER RANKING OF GROUP LABORATORY

ACTIVITY AS IMPORTANT LEARNING ACTIVITY

	Great Lakes	Farwest	New England	Mideast	Scuthwest	Rocky	n: .	_	
	July Burken		new Lingzania	MIGGAST	Scathwest	Mountains	Plains	Southeast	Total U.S
Mean	2.02	2.26	2.16	1.81	1.81	1.98	2.08	1.73	. 04
S.D.	1.35	1.39	1.37	1.36	1.35	1.43	1.37		1.96
N	459	313						1.33	1.37
.,	439	212	130	434	182	85	224	362	2189

Each of the six learning activity variables was used as the dependent variable in separate stepwise regression analyses. The results of these analyses are given in Tables 45, 46, 47, 48, 49, and 50.

In the following section the results for each of these six learning activities will be presented and discussed. The results will include the descriptive information, the correlates and the regression analyses.

The intracorrelations of the rankings of the learning activities were directly affected by the ranking process. If one activity was picked to be marked as "most important" then that limited the response a person could give for the next activity. These responses are not independent. This lack of independence leaves some question as to the alpha level for these correlations.

The correlations among these six learning activities, with no correction made for interdependence, were all negative or not significantly ($\alpha \leq 0.001$) different from zero except for one pair. The relationship between Teacher Ranking of Lecture-Discussion as Important Learning Activity and Teacher Ranking of Science Demonstration as Important Learning Activity was significant and positive ($\alpha \leq 0.001$) in four of the eight regions. Those teachers which ranked lecture-discussion high tended to rank demonstration high.

Lecture

The mean for Teacher Ranking of Lecture as Important Learning Activity ranged from a low of about 0.70 in the Rocky Mountains and Farwest regions to a high of about 1.10 in the New England and Southwest regions. These rankings are in the "used" but not "ranked" as important range. See Table 39, p64. There were no significant correlates for lecture.

The best predictors of Teacher Ranking of Lecture as Important Learning Activity were the rankings for lecture-discussion learning activities, student performance in the laboratory for grading criterion and the importance of test scores for grading. See Table 45, p67.

Lecture-Discussion

The mean for Teacher Ranking of Lecture-Discussion as Important Learning Activity ranged from a low of about 2.80 in the Rocky Mountains region to a



TABLE 45

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHER RANKING OF LECTURE AS IMPORTANT LEARNING ACTIVITY

Great I	akes (N ≃	459)				Mideast	(N ≈ 433)				
	Variable No. and Abbrev.	Multiple R	Ř Square	HSQ Change	Simple R		Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simpl g
All Variables	48 Lect Disc	0.22	0.05	0.05	-0.22	All Variables	None		•••		
Total Enroll. Forced	34 Tot Roll 48 Lect Disc	0.01	0.00	0.00	0.01 -0.2?	Total Enroll. Forced	34 Tot Foll	0.05	0.00	0.00	-0.04
School Type Forced	15 Type J-Sr 15 Type Sr 17 Type Jr 48 Lect Disc	0.01 0.13 0.13 0.27	0.00 0.02 0.02 0.07	0.00 0.02 0.00 0.05	0.01 0.11 -0.12 -0.22	School Type Forced	15 Typ+ J-Sr 16 Type Sr 17 Typ• Jr	0.14 0.15 0.15	0.02	0.00	0.14 -0.01 -0.08
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 48 Lact Diac	0.01 0.13 0.13 0.14 0.27	0.00 0.02 0.02 0.02 0.02	0.00 0.02 0.00 0.00 0.05	0.01 0.11 -0.12 0.01 -0.22	School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Jr 17 Type Jr 34 Tot Roll	0.14 0.15 0.15 0.15	0.02 0.02 0.02	0.00 0.00 0.00 0.02	0.14 -0.01 -0.05 -0.05
Farwest	(N = 309)					Southwes	st (N = 182	2)			
	Veriable No.	Multiple R	p Squars	RSQ Change	Simple F		Variable No. and Abbrev.	Multiple R	R Bquare	RAQ Change	dimpla k
All Variables Free	tione	•				All Variables Pros	61 Forf Lab 48 Lact Disc 58 G Test	0.27 0.40 0.40	0.07 0.16 0.11	0.07 0.04 0.05	-0.27 -0.25 0.16
Total Enroll. Forced	34 Tot Poli	0.01	0.00	0.00	0.01	Total Enroll.	ji Tot Roll 61 Perf Lab	0.10	0.01	G.01 0.07	-0.10 -0.27
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr	0.18 0.18 0.15	0.03 10.03 20.03	0.03 0.00 0.00	0.18 -0.05 -0.02	School Type	58 G Test 15 Type J-Sr	0.46	0.16	0.09 0.05 0.01	-0.25 0.16 -0.10
School Type 5 Total Enroll. Forced	15 Type I-3r 16 Type Sr 17 Type Jr 34 Tot Foll	0.18 0.16 0.18 0.19	0.03 0.03 0.03	0.0° 0.00 0.00	0.18 -0.05 -0.32 0.01	Forced	16 Type 3r 17 Type Jr 61 Perf Lab 48 Lact Disc 89 NSF	0.11 0.17 0.31 0.43	0.01 0.03 0.10 0.19 0.23	0.00	0.09 -0.07 -0.25 -0.24
						School Typs & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 89 NSr 48 Lect Disc 61 Perf Lab	0.10 0.11 0.17 0.23 0.34 0.41	0.01 0.01 0.03 0.05 0.12 0.17 0.24	0.01 0.00 0.02 0.02 0.05 0.05	-0.10 0.09 -0.07 -0.10 -0.24 -0.25 -0.27
New Engl	and (N =	130)				Rocky Mo	untains (N	≈ 85)			
	Variable Ho. and Achrev.	Multiple R	R Square	RSQ Change	Simple		Yariable No. and Abbrev.	Multiple R	NA Square	R5Q Change	Simple R
ill Variables	57 Anto Yut 50 Nat - Diac	0.2 5 0.34 0.45	0.07 0.11 0.20	0.07	0.26 0.22 -0.14	All Variables Free	31 SCIP Bio Roll 03 NDEA Eq 56 Prog Inst	0.40 0.47 0.32	0.16 0.22 0.28	0.16 0.06 0.06	0.40 -0.18 0.20
otal Enroll.	ict Soll 7 Auto Tut 58 C Test 48 Lect Disc	0.03 0.26 0.34 0.45	0.00 0.07 0.11 0.21	0.00 0.07 0.05 0.09	-0.03 0.26 0.22 -0.14	Total Enroll. Forced	34 Tot Roll 31 SCIP Bio Roll 03 MDEA Eq 56 Prog Inst 26 Teach Sci M	0.15 0.40 0.47 0.53 0.57	0.02 0.16 0.22 0.28 0.33	0.02 0.14 0.06 0.06 0.05	0.15 0.40 -0.18 0.20 0.00
chool Type orced	15 Type J-Sr 16 Type Sr 17 Type Jr 57 Auto Tut 58 G Test 48 Lect Disc	0.08 0.08 0.08 0.27 0.35 0.47	0.01 0.01 0.03 0.08 0.12 0.22	0.01 0.00 0.00 0.07 0.05 0.10	0.08 -0.07 0.03 0.26 0.22 -0.14	School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 87 Course Physics 68 Inservice 82 SCIP Phys TE	0.03 0.39 0.39 0.47 0.54 0.59	0.00 0.15 0.15 0.22 0.29	0.00 0.15 0.00 0.07 0.07	0.03 0.36 -0.35 -0.16 0.15 0.21
chool Type 5 otal Enroll. orced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Poll 57 Auto Tut 58 G Test 48 Lect Disc	0.08 0.08 0.08 0.08 0.28 0.35 0.47	0.01 0.01 0.01 0.01 0.00 0.12 0.22	0.01 0.00 0.00 0.00 0.07 0.05 0.10	0.08 -0.07 -0.04 -0.04 -0.26 -0.12 -0.14	School Type & Total Enroll.	03 NDEA Eq 15 Type 3-dr 16 Type 3r 17 Type 3r 17 Type Jr 34 Tot Roll 87 Course Physics 68 Leastwice 28 ECIP Phys TI 03 NDEA Eq	0.63 0.03 0.39 0.39 0.49 0.59 0.59	0.39 0.00 0.15 0.15 0.15 0.22 0.29 0.35 0.40	0.05 0.15 0.00 0.00 0.00 0.07 0.07	-0.18 -0.18 -0.96 -0.95 -0.15 -0.16 -0.15 -0.15



TABLE 45 Continued

Plains	(N	~	225	7
riains	1 11	_	223	,

	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Proc	Mari a				
Total Enroll. For.ed	; Tot Roll	0.01	0.00	0.00	0.01
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr	0.01 0.08 0.08	0.00 0.01 0.01	0.00	-0.01 0.07 -0.07
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll	0.01 0.08 0.08 0.08	0.00 0.01 0.01 0.01	0.00 0.01 0.00 0.00	-0.01 0.07 -0.07 0.01

Southeast (N = 363)

	Variable No and Abbrev.		R Square	RSQ Change	Simple S
All Variables Free	58 G Test 48 Lect Di	0.20 0.30	0.04	0.04	0.20
Total Enroll. Forced	34 Tot Rol 58 G Test 48 Lect Di 61 Perf La	0.20 sc 0.30	0.00 0.04 0.09 0.14	0.00 0.04 0.05 0.05	0.04 0.20 -0.15 -0.17
School Type Forced	15 Type J- 16 Type Jr 17 Type Jr 43 Movie P 68 G Test 48 Lect Di 61 Perf La	0.10 0.11 roj 0.21 0.28 sc 0.37	0.00 0.01 0.01 0.05 0.08 0.14 0.19	0.00 9.01 0.00 0.03 0.03 0.06 0.05	-0.02 0.10 -0.09 -0.19 0.20 -0.15 -0.17
School Type & Total Enroll. Forced	15 Type 1-1 16 Type 3r 17 Type 4r 34 Tot Roll 61 Perf Let 48 Lect Dis 58 G Test	0.10 0.11 0.11 0.21	0.00 0.01 0.01 0.05 0.10 0.15	0.00 0.01 0.00 0.00 0.03 0.05	-0.02 0.10 -0.09 0.04 -0.17 -0.15 0.20

	Variable and Abb		Multiple R	R Square	RSQ Change	Simple R
All Variables Free	58 G T 48 Lec	est t Disc	0.16 0.28	0.03	0.03	0.16
Total Enroll. Forced	58 G T	Roll est t Disc	0.00 0.16 0.28	0.00 0.03 0.08	0.00 0.03 0.05	0.00 0.16 -0.16
School Type Forced	16 T/p	e J-Sr e Sr e Jr t Disc	0.02 0.10 0.10 0.20 0.30	0.00 0.01 0.01 0.04 0.09	0.00 0.01 0.00 0.03 0.05	0.02 0.07 -0.10 -0.16 0.16
School Type & Total Enroll. Forced	16 7/pe 17 7/pe 34 Tot	Jr Roll Disc	0.02 0.10 0.11 0.20 0.30	0.00 0.01 0.01 0.01 0.04 0.09	0.00 0.01 0.00 0.00 0.03 0.05	0.02 0.07 -0.10 9.00 -0.16 0.16



TABLE 46

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHER RANKING OF LECTURE-DISCUSSION AS IMPORTANT LEARNING ACTIVITY

Great I	Lakes (N	≈ 459))			Mideast	(N ≈ 43	3)			
	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R		Variable No. and Abbrev.	Multiple R	R Square	954 Change	31æ
All Variables Free	58 G Test 47 Lecture	0.33 0.42	0.11 0.18	0.11 0.07	0.33 -0.22	All Variable:	∎ 58 G t (t	0.35	0.13	0.13	٥.
Total Enroll. Forced	. 34 Tot Roll 58 G Test 47 Lecture	0.05 0.33 0.42	0.00 0.11 0.18	0.00 0.11 0.07	0.05 0.31 -0.22	Total Enroll.	. 34 Tot Poll 58 d Test	0.03	0.∞ 0.13	0.00 0.12	0. 0.
School Type Forced	15 Type J-Sr 16 Type Sr		0.00	0.00	0.00 0.37	School Type Forced	15 Type J-S 15 Type Sr	0.12	٥.۵ <mark>٥</mark> ٥.٥١	0.00	-0. J.
	17 Type Jr 58 G Test 47 Lecture	0.09 0.33 0.43	0.01 0.11 0.18	0.00 0.10 0.07	-0.09 0.33 -0.22		17 Type Jr 58 G Test	0.12	0.02	0.12	-0.°
School Type & Total Enroll.	15 5790 J-Sr		0.00	0.00	0.00	School Type & Total Enroll. Forced	16 Type Sr 17 Type Jr	3.12 6.12	ე.თ. ე.თ. ე.თ⊋	2.00 2.01 0.00	-0. 0. -0.
Forced	17 Type Jr 34 Tot Roll 56 G Test	0.09 0.10 0.34	0.01 0.01 0.11	0.00 0.00 0.10	-0.09 0.05		34 Tot Noll 58 0 Test	0.12	0.02	0.∞ 0.12	0.
	47 Lecture	0.43	0.18	0.07	-3.22						
Farwest	(N ≈ 309	9)				Southwes	st (N ≈]	82)			
	Variable No. and Abbrev.	Multiple R	P Save se	9sq	21m21e		Veriable No.	Multiple R	R Square	RSQ Change	Simp R
All Variables Free	5d 1 Test 5l Perf (ab	0.32 0.40	0.11 0.16	0.11 0.05	R ≎.32 -0.22	All Variables	58 G Test 47 Lecture	0. 36 0. 48	0.13	0.13	0.3 -0.2
Total Enroll.	34 Tot Roll 50 3 Test	0.08 0.33	0.51	0.01	5.08 5.32	Total Enroll. Forced	34 Tot Poll 58 G Test	0.02	0.00	0.00	0.0
School Type	61 Ferf Lab 15 Type J-Sr	0.40	ი.16 ი.00	0.05 0.00	-0.27 -0.01	School Type	47 Lecture 15 Type J-Sr	0.02	0.23	0.09	-0.2 -0.0
Forced	16 Type Or 17 Type Jr 58 G Test	0.07 0.08 0.33	0.00 0.01 0.11	0.00 0.00 0.10	0,06 -0,65 0,30	Forced	16 Type Sr 17 Type Jr 58 G Test	0.08 0.12 0.39	0.01 0.01 0.15	0.01 0.01 0.14	0.04 -0.04 0.34
School Type &	61 Perf Lab	0. → 0 0.01	0.16 0.90	0.05 6.00	-0.22 -0.01	School Type & Total Enroll.	47 Lecture	0.50	0.25	0.09	-0.0
Cotal Enroll.	lo Type Sr 17 Type Jr 34 Tot Roll	0.07 3.08 0.10	0.00 0.01 0.01	0.00 0.00 0.00	0.06 -0.05 0.06	Forced .	16 Type 3r 17 Type Jr 34 Tot Roll 58 G Test	0.08 0.12 0.12 0.39	0.01 0.01 0.01	0.01	0.0 -0.0 0.0
	58 3 Test 61 Perf Lab	0.33	0.11 0.16	0.10 0.05	-0115 5135		47 Lecture	0.50	0.15	0.14	0. 16 -0.2
New Engl	and (N =	130)				Rocky Mo	untains	(N = 8	5)		
	Variable No.	Hultiple	, ,	RSQ	Simple		Variable No.	Multiple	R	RSC	Simpl
ll Variables	58 G Test 47 Lecture	0.50	3quare 0.25	Change 0.25	0.50	All variables	58 O Test 61 Perf Lab	0.40 0.52	0.16 0.28	O.16	7. 0.40
otal Enroll.	34 Tot Roll 58 G Test	0.57	0.32	0.00	0.06		04 ESEA Eq 57 Auto Tut 50 Films	0.59 0.63 0.67	0.34	0.12 0.07 0.05	-0.19 0.30 -0.13
	47 Lecture 27 Teach 3ci F	0.51 0.57 3.62	0.36 0.32 0.39	0.25 0.07 0.06	9.50 -0.14 -0.17	Total Enroll	14 Tot Roll 58 G Test	0.06	0.00 0.16	0.00	-0,06
chool Type orded	15 Type Jel. 16 Type Sr 17 Type Jr	0.07 0.10 0.16	0.01	0.01 0.01	0.07 9.01		61 Perf Lab 04 ESEA Eq 57 Auto Tut	0.52 0.59 0.63	0.28	0.11 0.07 0.05	0.19
	58 G Test 47 Lectura	0.58 0.58	3.62 3.27 9.34	0.24	-0.33 -0.50 -0.14	School Type	50 Films 15 Type J-Sr	0.67	0.45	0.05	0.25
thool Type & otal Enroll.	15 Type U-Sr 16 Type Ir	0.10 0.10	0.01	5.01 5.31	0.07 C.31	forced	16 Type Sr 17 Type Jr 58 G Test	0.07 0.20	0.00	0.50 9.60	0.02
	17 Type 'r 34 Tot Poll 58 G Test	9.16	0.02 0.17 0.27),36 3.24	-0.04 -5.56 -5.56		04 ESEA Eq 52 Ind Lab	0.56 0.62	0. 11 0. 15	0.15 0.12 0.07	0.40 0.40 0.45
	47 Lecture 27 Teach Sci F	0.59	0.40		-0.14 -0.17	School Type A	50 Films 57 Auto Tut 15 Type J-Sr	ນ.66 ນ.70 ນ.ວ 1	0.48		0.25
						Total Enroll.	16 Type dr 17 Type dr	9,07 9,29	ი.თ ი.∵⊶		0,05 1,02 -0,12
						İ	34 Tot Roll 58 O Test 04 ESEA Eq	بلبا. ٥	0.19	0.00 0.15 0.13	-0.36 -0.40 -0.30
							52 Ind Lab	0.62	0.38		-0.35



TABLE 46 Continued

Plains	$(N \approx 225)$)			
	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	51 Ind Study 83 SCIP PS TE 47 Lecture	0.38 0.48 0.53	0.15 0.23 0.29	0.15 0.09 0.05	-0.39 -0.31 -0.13
Total Enroll. Forced	34 Tot Roll 51 Ind Study 83 SCIP PS TE 47 Lecture	0.15 0.41 0.50 0.55	0.02 0.17 0.25 0.30	0.02 0.15 0.08 0.05	-0.15 -0.38 -0.31 -0.13
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 51 Ind Study 83 SCIP PS TE 47 Lecture	0.13 0.20 0.20 0.42 0.49 0.54	0.02 0.04 0.04 0.17 0.24 0.29	0.02 0.02 0.00 0.13 0.07 0.05	0.13 0.06 -0.17 -0.38 -0.31 -0.13
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 51 Ind Study 83 SCIP FS TE 47 Lecture	0.13 0.20 0.20 0.24 0.44 0.51	0.02 2.04 0.04 0.06 0.19 0.26 0.31	0.02 0.02 0.00 0.02 0.13 0.06 0.05	0.13 0.06 -0.17 -0.15 -0.38 -0.31

Southeast (N \approx 363)

		riable No. d Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables	58	G Test	0.34	0.11	0.11	0.34
1100	29	SCIP PS Roll	جيّا.ه	0.17	0.06	-0.29
	47		0.47	0.22	0.05	-0.15
	61	Perf Lab	0.52	C.27	0.05	-0.29
Total Enroll.	34	Tot Roll	0.01	0.00	0.00	-0.01
Forced	58	G Test	0.34	0.12	0,11	0.34
	29	SCIP PS Roll	0.42	0.17	0.06	-0.29
	47	Lecture	0.47	0.22	0.05	-0.15
	61	Perf Lab	0.52	0.28	0.05	-0.29
School Type	15	Type J-Sr	0.01	0.00	0.00	-0.01
Forced	16	Type Sr	0.18	0.03	0.03	0.16
	17	Type Jr	0.18	0.03	0.00	-0.15
	58	G Test	0.36	0.13	0.10	0.34
	61	Perf Lab	0.44	0.20	0.06	-0.29
	47	Lecture	0.52	0.27	0.07	-0.15
School Type &	15	Type J-3r	0.01	0.00	0.00	-0.01
Total Enroll.	16	Type Sr	0.18	0.03	0.03	0.16
Forced	17	Type Jr	0.18	0.03	0.00	-0.14
	34	Tot Roll	0.18	0.03	0.00	-0.01
	58	G Test	0.37	0.13	0.10	0.34
	61	Perf Lab	0.44	0.20	0.06	-0.29
	47	Lecture	0.52	0.27	0.07	-0.15

	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Pree	58 G Tost 47 Lecture	0.34 0.41	0.12 0.16	0.12 0.05	0.34 -0.16
Total Enroll. Forced	34 Tot Roll 58 G Test 47 Lecture	0.02 0.34 0.41	0.00 0.12 0.17	0.00 0.12 0.05	0.02 0.34 -0.16
School Typs Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 58 G Test 47 Lecture	0.02 0.11 0.35 0.42	0.00 0.01 0.01 0.12 0.17	0.00 0.01 0.00 0.11 0.05	0.02 0.03 -0.10 0.34 -0.16
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 58 O Test 47 Lecture	0.02 0.11 0.11 0.11 0.35 0.42	0.00 0.01 0.01 0.01 0.12 0.17	0.00 0.01 0.00 0.00 0.11 0.05	0.02 0.09 -0.10 0.02 0.34 -0.16



TABLE 47

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHER RANKING OF SCIENCE DEMONSTRATION AS IMPORTANT LEARNING ACTIVITY

Great L	akes (N ≃	459)				Mideast	(N	≃ 433)				
	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R			ariable No. nd Abbrev.	Multiple R	R Square	RFQ Change	Simple
All Veriables Free	Hone	****	****			All Variable		5 Roll 03	0.28	0.08	0.08	0.39
Total Enroll. Forced	34 Tot Roll	0.01	0.00	0.00	-0.01	Total Enroll Forced		4 Tot Poll	0.14	0.02	0.02	0.14
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr	0.05 0.13 0.14	0.00 0.02 0.02	0.02 0.00	-0. 05 0.07 0.14	School Type	63 15		0.36 0.07	0.13 0.31	0.05	0.24 -0.07
	59 Writ Assign 87 Course Physics	0.26	0.07	0.05	0.21	Forced	16 17 06	Type Jr	0.1½ 0.1³ 0.29	0,02 20,0 50,0	0.01 0.00 0.06	-0.0e. 0.12 0.75
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 59 Writ Assign 87 Course Physics	0.05 0.13 0.14 0.14 0.26 0.34	0.00 0.02 0.02 0.07 0.11	0.00 0.02 0.00 0.00 0.05 0.05	-0.05 -0.07 -0.14 -0.31 -0.21	School Type # Total Enroll Forced	. 11. 17 34	Type Or Type Ur	0.07 9.13 0.13 0.22 0.32	0.01 0.02 0.05 0.10	0.01 0.01 0.00 0.01 0.05	-0.07 -0.05 -0.12 -0.14 -0.24
Farwest	(N ≃ 309)					Southwes	t ((N ~ 182)			
	Variable No.	Multiple R	R Square	PPQ Change	Simple			riable No. I Abbrev.	Multiple R	R Square	RSQ Change	Simple R
Ali Variables Free	84 Course Bio	0.25	0.06	0.06	-0.25	All Variables Free	88	Course Pty Sc	1 0.27	0.07	0.07	0.27
Total Enroll. Forced	34 Tot Roll 84 Course Blo	0.01 0.25	o.∞ o.∞	0.00 0.06	0.31 -0.24	Total Enroll. Forced	314 88	Tot Roll Course Phy Sc:	0.06 1 0.27	0.00	0.00	-0.06 0.27
School Typ e Forced	15 Type J-Dr 16 Type Sr 17 Type Jr 75 Hrs Phy Sci	0.06 0.19 0.25 0.33	0.00 0.04 0.06 0.11	0.00 0.0+ 0.02 0.05	5.04 -0.17 5.17	School Type Forced		Type J-Sr Type Sr Type Jr	0.11 0.27 0.21	0.02 0.07 0.07	0.02 0.05 0.00	-0.16 -0.14 0.23
School Type & Total Enroll. Forced	15 Type J-Or 16 Type in 17 Type Jr 34 Tot Foll 75 Hre Phy Sci	0.06 0.19 0.25 0.25 0.34	0.00 0.04 0.06 0.06 0.11	0.00 1.03 0.02 0.00 0.05	0.05 -0.14 0.02 0.01 0.17	School Type & Total Enroll. Forced	15 16 17 34	Type J-Sr Type Sr Type Jr Tot Roll	0.16 0.27 0.27 0.28	0.02 0.07 0.07 0.08	0.02 0.05 0.00 0.01	-0.16 -0.14 0.23 -0.06
New Engl		30)	R Square	RfQ Change	Simple p	Rocky Mor	Vari	ains (N	~ 85) Multiple	RR Square	PEQ Change	Simple :
ll Variables Tres	79 SCIP BIO TE	0.34	0.11	0.11	-0.34	All Variables Free	19	Perf (Ab Sci Club Course Bio	0.37 0.45 0.54	0.14 0.20 0.30	0.14	-0.17 0.13 -0.24
Total Enroll.	34 Tot Poll 84 Course Blo 26 Teach Sci M 54 CL Assign	0.13 0.37 0.44 0.49	0.02 0.14 0.19 0.24	0.02 0.12 0.02 0.05	0.13 -0.34 -0.04 0.16	Total Enroll. Forced	;14 61 84	Tot Holl Perf Lab Course Bio Sci Club	0.04 0.77 0.45 0.55	0.00 0.1- 0.71 0.30	9.14 9.07 9.09	-0.01 -0.37 -0.24 0.13
	15 Type J-SR	0.01 0.02 0.04	0.00 0.00 0.00 0.12	0.00	-0.01 -0.01 -0.01	School Type Forced	16 1 17 1 61 1	Type I-Sr Type Sr Type Ir Ferf (ab	0.15 0.25 0.45	0.02 0.04 0.05 0.1	0,02 0,0, 0,0 0,1	-0.15 -0.09 -0.11 -0.37
School Type Forced	15 Type 3r 17 Type Jr 79 3CIP Bio TE	9.36	0.12			1	HO					
chool Type & otal Enroll.	17 Type Jr		0.00 0.00 0.00		-0.01 -0.01 0.01	School Type &	75 t	adir Chem Tr Kre Sci Dype J-Sr	0.57 0.57	0.43	0.02	0.20 -0.29 -0.15



TABLE 47 Continued

Plains (N = 225)

Variable No. and Abbrev.		Multiple R	R Square	PSQ Change	Simple R	
All Variables Free	18 SCIP USE 48 Lect Disc 84 Course Bio	0.28 0.36 0.42	0.08 0.13 0.18	0.08 0.05 0.05	-0.28 0.27 -0.19	
Total Enroll. Forced	3L Tot Roll 18 SCIP USE 48 Lect Disc 8L Course Bio	0.01 0.28 0.37 0.43	0.00 0.08 0.14 0.19	0.00 0.08 0.06 0.05	-0.01 -0.28 0.27 -0.19	
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 18 SCIP USE 77 Hrs Math 48 Lect Disc	0.11 0.14 0.14 0.30 0.37 0.43	0.01 0.02 0.02 0.09 0.13 0.18	0.01 0.01 0.00 0.07 0.05	0.11 0.01 -0.11 -0.28 0.19 0.27	
School Type & Total Enroll. Forced	15 Type J-sr 16 Type Sr 17 Type Jr 34 Tot Roll 18 ScIP USE 48 Lect Disc 84 Course Bio	0.11 0.14 0.14 0.14 0.31 0.38 0.45	0.01 0.02 0.02 0.02 0.10 0.15 0.20	0.01 0.01 0.00 0.00 0.06 0.05	0.11 0.01 -0.11 -0.01 -0.28 0.27 -0.19	

Southeast (N = 363)

	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple H
All Variables Free	84 Course Bio 52 Ind Lab	0.26 0.36	0.07 0.13	0.07	-0.26 -0.24
Total Enroll. Forced	34 Tot Poll 84 Course Bio 52 Ind Lab	0.04 0.26 0.36	0.00 0.07 0.13	0.00 0.07 0.06	-0.04 -0.26 -0.24
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 84 Course Bio 52 Ind Lab	0.01 0.12 0.12 0.27 0.36	0.00 0.01 0.01 0.07	0.00 0.01 0.00 0.06 0.06	-0.01 -0.10 0.09 -0.26
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Jr 17 Type Jr 34 Tot Roll 84 Course Bio 52 Ind Lab	0.01 0.12 0.12 0.12 0.12 0.27 0.36	0.00 0.01 0.01 0.01 0.07 0.13	0.00 0.01 0.00 0.00 0.06 0.06	-0.01 -0.10 0.07 -0.04 -0.26 -0.24

	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R	
All Variables Free	None					
Total Enroll. Forced School Type	34 Tot Roll 84 Course Bio 15 Type J-Sr	0.03 0.22 0.02	0.00	0.00	0.03 -0.21 -0.02	
Forced	16 Type Sr 17 Type Jr	0.12 0.12	0.02	0.01	-0.10 0.12	
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll	0.02 0.12 0.12 0.14	0.02 0.03 0.00	0.00 0.01 0.00 0.00	-0.02 -0.10 0.12 0.03	



73 TABLE 48

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHER RANKING OF INSTRUCTIONAL FILMS AS IMPORTANT LEARNING ACTIVITY

Great L	akes (N ≃	459)				Mideast	(1)	N - 433)				
	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R			ariable No. nd Abbrev.	Hultiple	R Square	PSQ Change	Simple R
All Variables Free	55 Field Trips	0.28	0.08	0.08	0.28	All Variables		5 Field Trips	0.25	0.06	0,06	0.25
Total Unroll. Forced	34 Tot Roll 55 Field Trips	0.02 0.28	0.00 80.0	0.00 80.0	0.œ 0.2₺	Total Enroll. Forced		4 Tot Roll 5 Field Trips	0.08 0.26	0.C1 0.07	ე.01 ს.06	-0.08 0.25
School Type Forced	19 Type J-Sr 16 Type Sr 17 Type Jr 55 Field Trips	0.06 0.06 0.09 0.29	0.00 0.00 0.01 0.08	0.00 00.00 00.00 50.00	0.06 -0.02 0.01 0.23	School Type Forced			0.06 0.11 0.11 0.26	0.00 0.01 0.01 6.07	0.00 5.01 5.00 5.06	0. 0 -0.16 0.06 0.25
School Type & Total Enroll. Forced	15 Type J-Sr 10 Type Sr 17 Type Jr 34 Tot Roll 55 Field Trips	0.06 0.06 0.09 0.10 0.30	0.00 0.01 0.01 0.09	0.00 0.00 0.00 0.00 0.00	0.06 -0.07 0.01 0.07 0.25	Schrol Type & Total Enrull. Forced	1' 1'		0.05 0.11 0.11 0.26	0.00 0.01 0.01 0.01 0.07	7.60 0.01 0.00 2.00 0.00	0.06 -0.10 0.06 -0.08 0.25
Farwest	(N = 309)					Sathwes	 t	(N 182))			e in wheel of a second
	Variable No. and Abbrev.	Multiple R	p Square	RSQ Change	Stamp'- R			ariable No. Ed Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	43 Movie Proj	0.22	0.05	0.05	0.25	All Variables Free		Movie Proj 7 Teach Sci F	0.29 0.37	0.08	0.08	0.29
Total Enroll. Forced	34 Tot Roll 43 Movie Proj	0.00	0.00	ა.თ ე.თე	-0.00 0.22	Total Enroll. Forced	43	Tot Roll Movie Prog Teach Sci Y	0.10 0.30 0.37	0.01 0.09 0.14	0.01 ૭.૦૭ .05	0.10 0.29 0.25
School Type Forced	15 Type U-Sr 16 Type Cr 17 Type Jr	0.04 0.15 0.22	0.00 0.32 0.35	0.00 0.00 0.02	-0.34 -3.14 3.44	School Type Forced	15 16 17	Type Sr	0.06	0.00 0.00	0.00	-0.06 0.06
School Type & Total Enroll. Forced	15 Type U-Sr 15 Type Fr 17 Type Ur	0.04 0.25 0.22	0.00 0.02 0.05	0.00 0.02 0.02	5 7.1.		43 27	Movie inoj	0.10 0.41 0.38	0.01 0.09 0.14	10.2 Ho.u (0.0	-0.05 0.29 0.25
	34 Tot Roll	0.22	o.cs	0.00	-ଧାର୍ଷ	Sabool Tyre & Total Enroll. Forced		Type ir Type ir	0.06 0.07 0.13 0.13 0.30 0.38	0.00 0.00 0.01 0.02 0.09 0.14	0.00 0.00 0.01 0.01 0.08 0.05	-0.06 -0.05 -0.05 0.10 0.29 0.25
New Engl	and (N - I	30)			<u>-</u>	Rocky Mo	un l	tains (N	·: 85)			
	Variable No. and Abbrev.	Multiple R	A Square	RSQ Change	Simple R		727		Hultiple R	R Square	RSQ Change	Simple R
All Variables From Total Enroll.	56 Prog Inst 58 G Test	0.30 0.37 0.01	0.09	0.09	0.30 0.23 -0.01	All Variables From	88 76 70 48	Course Phy Joi Hrs Earth Small Classes Lect Disc	0.31 0.40 0.43 0.55	0.10 0.16 0.24 0.30	0.10 0.06 0.08 0.06	-0.31 3.16 0.21 0.25
Forced School Type Forced	56 Prog Inst 58 G Test 15 Type J-Sr 16 Type Sr 17 Type Jr	2.10 0.37 2.14 0.15 9.15	0.09 0.14 9.02 0.02 0.02	0.09 0.05 0.02 0.00 0.00	0.14	fotal foroll. Forced		Tot Poll Course Phy uci Hrs tarth Small Classes Lect Disc	0.15 0.14 0.41 0.40 0.55	0.02 0.11 0.17 0.24 0.30	0.02 0.08 0.06 0.07 0.06	0.15 -0.51 0.16 0.41 0.25
School Type & Total Enroll. Forced	56 Prog Inst 58 G Test 15 Type J-Sr 10 Type Jr 17 Type Jr 14 Tot Poll 56 Prog Inst	0.33 0.40 0.14 0.15 0.15 0.15 0.16	0.11 0.16 0.02 0.02 0.02 0.02 0.11	0.09 0.05 0.02 0.00 0.00 0.00 0.00	0.45 0.45 0.45 -0.55 -0.05 -0.01	School Tyre Forced	15 16 17 88 70 76	Type J-Sr Type Sr Type Sr Type Jr Phy Sci Small Classes Hrs Earth Lect Disc	0.15 0.17 0.17 0.49 0.48 0.54	0.02 0.03 0.03 0.15 0.24 0.24	0.02 0.01 0.00 0.12 0.08 0.04 0.06	-0.15 0.12 -0.04 -0.11 0.21 6.16 0.25
	58 G Tost	2.40	0.16	0.05	á, e i		34 68 70 75	Type J-dr Type Sr Type Jr Tot 9:11 Phy Sci Small Classes Hrs Earth Lect Disc	0.17 0.17 0.17 0.20 0.48 0.52 0.58	0.02 0.03 0.03 0.0 0.0 0.23 0.23 0.28	0.02 0.01 0.00 0.01 0.12 0.04 f.04 0.05	-0.15 -0.15 -0.04 -0.15 -0.71 -0.21 -0.25



TABLE 48 Continued

T 1		/ > 1		0000
Pla	ins	(N	\simeq	223)

	Veriable No. and Abbrev.	Multiple K	R sreupt	RSQ Change	Simple R
All Variables Pros	55 Field Trips 73 Satisfaction	#.25 0.4	0.07	0.07	0.26 -0.21
Total Enroll. Forced	34 Tot Roll 55 Field Trips 73 Satisfaction	0.07 0.27 0.35	0.00 0.07 2.12	0.00 0.07 0.05	0.07 0.26 -0.21
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 55 Field Trips 73 Satisfaction	0. 0.21 0.21 0.33 0.40	0.00 0.04 0.04	0.00 0.0 0.00 0.07 0.05	-0.01 .18 .19 .26 -0.21
School Type & Total : aroll. Forcei	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 55 Field Trips 73 Satisfaction	0.0 0.2 0.21 0.21 0.37	v.16	0.00 0.04 0.00 0.00 0.07 0.05	-0.01 0.18 -0.18 0.07 0.26 -0.21

Southeast (N = 363)

	Variable Bo.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	43 Movie Proj	0.31	0.10	0.10	0.31
Total Enroll. Forced	34 Tot Poll 43 Movie Pruj	0.04	0.00	0.00	-0.04 0.31
School Type Forced	15 Type J-Or 16 Type Sr 17 Type Jr 43 Movie Proj	0.01 0.12 0.12 0.33	0.00 0.01 0.01 0.11	0.00 0.01 0.00 0.09	0.01 -0.11 0.10 0.31
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 43 Movie Proj	0.01 0.12 0.12 0.12 0.33	0.00 0.01 0.01 0.01 0.11	0.00 0.01 0.00 0.00 0.09	0.01 -0.11 0.10 -0.04 0.31

	Variable No.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	43 Muvie Proj	0.24	0.06	0.06	0.24
Total Enroll. Forced	31 Tot Roll 43 Movie Proj	0.00	0.00	0.00	-0.00 0.24
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 43 Movie Proj	0.02 0.04 0.04 0.25	0.00 0.00 0.00 0.06	0.00 0.00 0.09 0.06	0.02 -0.04 0.03 0.24
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 43 Movie Proj	0.02 0.04 0.04 0.04 0.25	0.00 0.00 0.00 0.00 0.06	0.00 0.00 0.00 0.00 0.06	0.02 -0.04 0.03 -0.00 0.24



TABLE 49

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHER RANKING OF INDIVIDUAL LABORATORY AS IMPORTANT LEARNING ACTIVITY

Great L	akes (N =	459)				Mideast	(N = 433)				
	Variable No. and Abbrev.	Hultiple N	R Square	RSQ Charge	Simple R		Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple S
All Variables Free	53 Group Lab 61 Perf Lab	0.19 0.56	6.13 0.].	0 15 0.16	-0.39 0.12	All Variables Free	61 Perf Lab 53 Group Lab	0.34 0.48	0.11	0.11 0.12	0.34 -0.20
Total Enroll. Forced	34 Tot Roll 53 Group Lab 61 Perf Lab	0.06 0.40 0.57	0.00 0.16 0.32	0.00 0.16 0.16	0,66 -0.39 0.32	Total Euroll. Forced	44 Tot Roll 61 Perf Lab 53 Group Lab	0.01	0.00 2.12 0.24	0.00 0.11 0.12	-0.0; 0.14 -0.20
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 53 Group Lab 61 Perf Lab	0.02 0.03 0.03 0.39 0.56	0.00 0.00 0.00 0.16 0.32	0.00 0.00 0.00 0.15 0.16	-0.00 -0.01 0.02 -0.39 0.32	School Type Forced	15 Type fair 16 Type Or 17 Type Jr 61 Perf Lab 53 Group Lab	0.03 0.07 0.07 0.34 0.45	0.00 0.01 0.12 0.23	0,00 0,00 0,00 0,11 0,12	-0.0 (0.07 +0.05 0.44 -0.20
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 53 Group Lab 61 Parf Lab	0.0. 0.0.4 0.03 0.07 0.57	0.00 0.00 0.00 0.01 0.16 0.33	0.00 0.00 0.00 0.00 0.16 0.15	-0.00 -0.01 -0.00 -0.00 -0.00 -0.00	School Type & Total Erroll.	15 Type JAST 15 Type Sr 17 Type Jr 34 Tot Roll 61 Perf Lab 53 Group Lab	0.07 0.07 0.07 0.09 0.34 0.49	0.00 0.01 0.01 0.01 0.12 0.24	0.00 0.00 0.00 0.00 0.11 0.11	-0.03 -0.07 -0.03 -0.33 -0.34 -0.29
Farwest	(N ~ 309)					Southuse	t (N - 182			.	
	Variable No.	Multiple P	a Jquare	Riiq	. unite		Variable No.	Multiple R	# Square	RSQ Change	Simple R
All Variables		0. 32 0.52	0.10	0.10	3	All Variables		0.31	0.09	0.04)	0.11 -0.28
Total Encoll. Forced	74 Tat 9011 61 Fert Lab 53 Group (0.61 0.72 0.53	0.50 0.10 0.27	0.50 0.10 0.17	3.51 0.4 3.77	Total Enroll.		0.03	0.00 0.10 0.25	0.00 0.10 0.15	0.03 0.41 -0.28
School Type Forced	15 Dype 1-1r 16 Dype 1- 17 Dype 1- 61 Ferf Lan 53 Group Lac	1.14 2.17 1.17 1.19 0.6.	0.02 0.03 0.17 0.17 0.29	0.02 0.01 0.00 0.00 0.07	-0.14 -0.14 -0.41 -0.77 -0.77	School Typ⊕ Forced	15 Type J-Dr 16 Type Jr 17 Type Jr 61 Perf Lab 53 Group Lab	0.01 0.05 0.05 0.01 0.31	0.00 0.00 0.01 0.10 6.25	0 0 0 0 0.16	0.01 0.04 -0.04 9.14 -0.28
School Type & Total Enroll. Forced	15 Type J-or 16 Type Jr 17 Type Jr 34 Tol Roll 61 Perf Iab 53 Grou, Lab	0.13 0.17 0.17 0.15 0.35 0.54	0.00 0.01 0.03 0.03 0.12	0.00 0.00 0.00 0.00 0.00 0.07	-0.13 -0.15 -0.11 -0.01 -0.5 -0.25	School Type & Total Enroll. Forced	15 Type J-Gr 15 Type Gr 17 Type Jr 34 Tot Roll 61 Perf Lab 53 Group Lab	0.01 0.05 0.08 0.04 0.11 0.50	0.00 0.00 9.01 6.01 0.10 0.25	0.00 0.00 0.00 0.00 0.00 0.00 0.15	0.01 0.06 0.03 0.03 0.31 -0.25
New Engl	and (N =	130)		··-		Rocky Mou	intains (N	~ 85)			
	Variable No. and Abbrev.	Multiple R	g Square	REQ Change	Simple R		Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	61 Ferf Lab 53 Group Lab 51 Ind Study	0.33 0.46 0.55	0.11 0.21 0.31	0.11 0.10 0.09	0.33 -0.21 0.26	All Variables Free	61 Perf Lab 53 Group Lab 73 Satisfaction 48 Lact Disc	0.50 0.59 0.ひ 0.71	0.25 0.35 0.43 0.50	0.25 0.10 0.04 0.07	0.50 -0.12 0.6 -0.15
Total Enroll. Forced	34 Tot Roll 51 Perf Las 53 Oroup Las 51 Ind Study	0.05 0.34 0.47 0.57	0.00 0.11 0.22 0.32	0.00 0.11 0.11 0.10	-0.06 0.33 -0.1 0.76	Total Enroll. Forced	61 Ferf Late 53 Group Late 73 Satisfaction	0.18 0.51 0.61 0.66	0.03 0.26 0.37	0.03 0.22 0.11 0.07	0.18 0.50 -0.12 0.87
School Type Forced	15 Type J-dr 16 Type Ur 17 Type Jr 61 Perf Lb 53 Group Las 51 Ind Study	0.05 0.06 0.12 0.36 0.38 0.36	0.00 0.01 0.11 0.21 0.31	0.00 0.00 0.01 0.12 0.10 0.08	-0.05 0.00 0.00 0.11 -0.21 0.26	School Type Forced	48 Lect Disc 64 Innovation 15 Type J-dr 15 Type Br 17 Type Jr	0.71 0.75 0.06 0.24 0.26	6.5, 9.55 6.00 6.06 3.07	0.05 0.05 0.05 0.05 0.05	-0, (* -0, 15 -0, 06) -0, 24 -0, 15
Total Enroll.	15 Type Wr 16 Type Sr 17 Type Sr 34 Tot Poll	0.05 0.06 0.13	0.00 0.00 0.01 0.02	5,00 5,60 5,61 5,00	-0.555 -2.40 -5.40 -0.66		61 Perf Lab 53 Group Lab 73 Satisfaction 48 Lact Disc	U. (·	0.25 0.41 0.44 0.53	0 27 0.10 0.07 0.08	0,50 40,62 9,75 -0,45
	61 Perf Lab 53 Group Lab 51 Ind Study	0.37 0.49 0.57	0.13 0.24 0.32	0.12	0,14 -0.11 0.26	Bohuol Type % Total Enrull. Forced	in Type J-dr 16 Type Ur 17 Type Ur 34 Tot Holl 61 Perf Lab 93 Group Lab 73 Satisfaction 48 Lact Disc	0.06 0.16 0.17 0.57 0.63 0.68 0.73	0.00 0.07 0.07 0.07 0.28 0.39 0.46 0.53	0.00 0.05 0.01 0.01 0.21 0.11 0.06 0.04	-0,00, 0,24 -0,50 -0,50 -0,50 -0,50 -0,5



TABLE 49 Continued Plains (N \approx 225)

	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	53 Group Lab 61 Perf Lab 30 SCIP ES Roll	0.42 0.53 0.60	0.17 0.28 0.37	0.17 0.11 0.03	-0.42 0.23 0.23
Total Enroll. Forced	34 Tot 9011 53 Group Lab 61 Perf Lab 30 SCIP ES Roll	0.05 0.43 0.54 0.61	0.00 0.18 0.29 0.37	0.00 0.18 0.11 0.08	0.05 -0.42 0.23 0.23
School Type Forced	15 Type J-Sr 10 Type Sr 17 Type Jr 53 Group Lab 61 Perf Lab 50 SCIP ES Roll	0.01 0.05 0.10 0.42 0.55 0.61	0.00 0.00 0.01 0.18 0.30 0.38	0.00 0.00 0.01 0.17 0.12 0.08	-0.01 -0.03 0.07 -0.42 0.23 0.23
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 53 Group Lab 61 Perf Lab 30 SCIP ES Roll	0.01 0.05 0.10 0.11 0.43 0.56 0.62	0.00 0.00 0.01 0.01 0.19 0.31 0.38	0.00 0.00 0.01 0.00 0.17 0.12 0.07	-0.01 -0.03 0.07 0.05 -0.42 0.23

0 41		/ 11		200	- 1	٠
South	east	(N	~	- 3 !!	٠.3	:

		riable No. 1 Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	61 53		0.40 0.47	0.16	0.16 0.06	0.40 -0.02
Total Enroll. Forced		Tot Poll Fer: Lab Group Lab	0.17 0.41 0.48	0.03 0.17 0.23	0.03 0.14 0.07	0.17 0.40 -0.02
School Type Forced	15 16 17 61 53	Type J-Sr Type Sr Type Jr Perf Lab Group Lab	0.02 0.10 0.10 0.40 0.46	0.00 0.01 0.01 0.16 0.23	0.00 0.01 0.00 0.15 0.06	0.02 0.08 -0.07 0.40 -0.02
School Type & Total Enroll. Forced	15 16 17 34 61 53	Type J-Sr Type Sr Type Jr Tot Foll Perf Lab Group Lab	0.02 0.10 0.10 0.18 0.42 0.49	0.00 0.01 0.01 0.03 0.17 0.24	0.00 0.01 0.00 0.02 0.14	0.02 0.08 -0.07 0.17 0.40 -0.02

	Variable No. and Abbrev.		Multiple R	R Square	RSQ Change	Simple 8	
All Variables	61 53	Perf Lab Group Lab	0.34	0.12	0.12	0.34 -0.24	
Free	73	Group tas	0.71	0.2	0.27		
Total Enroll.	34	Tot Roll	0.05	0.00	0.00	0.05	
Forced.	61	Perf Lab	0.34	0.12	0.11	0.34	
	53	Group Lab	0.51	0.26	0.14	-0.24	
School Type	15	Type J-Sr	0.04	c.00	0.00	-0.04	
Forced	16	Type Sr	0.08	0.01	0.00	0.08	
	17	Type Jr	0.08	0.01	0.00	-0.04	
	61	Perf Lab	0.34	0.12	0.11	0.34	
	53	Group Lab	0.51	ი.26	0.14	-0.24	
School Type &	15	Type J-Sr	0.04	0.00	0.00	-0.04	
Total Enroll.	16	Tre Sr	0.08	0.01	0.00	0.08	
Forced	17	Type Jr	0.63	0.01	0.00	-0.04	
	34	Tot Roll	0.08	0.01	0.00	0.05	
	61	Perf Lab	0.34	0.12	0.11	0.34	
	53	Group Lab	0.51	0.26	0.14	-0.24	



TABLE 50

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHER RANKING OF GROUP LABORATORY AS IMPORTANT LEARNING ACTIVITY

Great L	Jakes (N =	459)				Mideast	(N	433)				
	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R			iable No.	Multiple	R Square	RSQ Change	Simple F
All Variables Free	52 Ind 'ab 61 Perf Lab	0.39 0.52	0.15 0.27	0.15 0.12	-0.39 °° '0	All Variables Free	61	Perf Iab Ind Lat	0,36 0,49	0.13	0.13	0, ¥6 -0.20
Total Enroll. Forced	34 Tot Holl 52 Ind Lab 61 Perf Lab	0.06 0.40 0.53	0.00 0.16 0.28	0.6 0.1 0.1	1.73 1.73	Total Empli:	າ1	Tot Full Perf LAD Ind LAD	0.08 0.17 0.50	0.01 0.13 c.25	0.01 0.13 0.12	-0.08 0.16 -0.20
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 50 Ind Lab 62 Perf Lab	0.0d 0.08 0.13 0.41 0.53	0.01 0.01 0.02 0.17 0.28	0.01 0.00 0.01 0.15 0.11	-0.08 0.05 0.05 -0.20	School Type Forced	16 17 61	Type J-Sr Type Si Type Jr Perf Lab Ind Lab	0.01 0.12 0.13 0.19 0.52	0.60 0.01 0.02 0.15 0.27	0.00 0.01 0.00 0.14 0.11	0,71 -0,11 0,11 0,36 -0,20
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 52 Ind Lab 61 Perf Lab	0.08 0.08 0.13 0.13 0.42 0.54	0.01 0.01 0.02 0.02 0.17 5.27	0.01 0.00 0.01 0.00 0.16 0.12	-0.08 0.05 0.05 0.05 0.06 -0.19 0.20	School Tyje & Total Enroll. Forced	17 34 61	Type J-Er Type Jr Type Jr Tot Roll Perf Lab Ind Lab	0.01 0.12 0.13 0.13 0.39	0.00 0.01 0.0 0.02 0.16 0.27	0.00 0.01 0.00 0.00 0.15 0.11	0.01 -0.11 0.11 -0.05 00.95 -0.50
Farwest	(N ~ 309)			<u> </u>	· · · · · ·	Southwest	1)	182				
•	Variable No. and Abbrev.	Mult ha	9 Square	RSQ Change	3imple			able No. Abbrev.	Nultiple R	g Equare	HSQ Change	Simple R
All Variables Free	61 Perf Lab 52 Ind Lab	. *	0.10 0.27	0.10 0.17	0. 년 -3.2번	All Varisoles Free	52	Perf Lab Ind Lab Prog Inst	0.30 0.50 0.54	0.09 0.25 0.29	0.09	0.36 -0.28 0.22
Total Enroll. Forced	34 To 61 Perf 4 52 Ind I s	9.07 3. Ø 2.98	0.00 0.10 0.27	0.00 1.10 3.17	0.07 3.22 -0.25	Total Enroll. Forced	34 ·	Tot Roll Wind Lab	0.22	0.05	0.05 0.08	0.22 -0.28
School Type Forced	15 Type J-C 16 Type Cr 17 Type Jr 61 Perf Lab 52 Ind Lab	0.11 0.04 0.14 0.34 0.54	3.00 3.01 3.02 0.11 0.29	0.00 0.01 0.01 0.1	0.01 0.07 -0.11 0.42 -0.45	School Type Forced	15 16 17 61	Perf Lab Type J-Sr Type Sr Type Sr Type Jr Perf Lab	0.51 0.11 0.11 0.14 0.33	0.26 0.01 0.01 0.02 0.11	0.13 0.01 0.00 0.01 0.03	0.30 -0.11 0.04 0.05 0.10
School Type & Total Enroll. Forced	15 Dye F-Sr 16 Dye Sr 17 Dye Sr 34 Tot Poll 61 Perf Lab 52 Ind Lab	0.01 0.0d 0.14 0.15 0.34 0.54	0.00 0.01 0.00 0.00 0.00 0.00 0.79	0.00 0.01 0.01 0.00 0.10 0.17	0.01 0.07 -0.11 0.07 0.07	School Type & Total Enroll.	56 1 15 3 16 3 17 3 34 7	Ind Lab Prog Inst Cype J-Sr Cype ir Cype ir Cype Jr Cype Jr Cype Ir C	0.51 0.55 0.11 0.11 0.14 0.25 0.38 0.52	0.26 0.31 0.01 0.02 0.02 0.05 0.15 0.27	0.15 0.05 0.01 0.00 0.01 0.04 0.08 0.13	-0.28 0.22 -0.11 0.04 0.05 0.32 -0.25 0.30
New Engl	and (N	130)			• • • • • • • • • • • • • • • • • • • •	у Мон	ita	ins (N	* 85)	· - • · · · -		
	Variable No. and Abbrev.	Multiple R	R 3quare	RSQ Change	Simple P			ible No.	Multiple	î Square	RIQ Change	Simple R
All Variables Fr a Total Enroll. Forced	61 Perf Lab 52 Ind Lab 55 Field Trips 34 Tot Roll 61 Perf Lab	0.29 0.43 0.49 0.12 0.31	0.08 5.19 0.24 0.01 0.10	0.08	0.29 -0.21 0.22 -0.12 0.29	All Variables Free	52 I 73 S 48 L 75 H	erf Lab Ind Lab atisfaction act Disc Ira Phy Sci Lass Assign	0.76 0.50 0.55 0.65 0.65 0.67	0.13 0.25 0.30 0.36 .42 0.47	0.13 0.12 0.05 0.05 0.05	0.36 -0.12 -0.22 -0.23 -0.21
School Type Forced	52 Ind Lab 55 Field Trips 15 Type J-Sr 16 Type Sr 17 Type Jr 61 Perr Lab 52 Ind Lab	0.05 0.12 0.17 0.32 0.45	0.21 0.26 0.00 0.01 0.03 0.10 0.21	0.05 0.00 0.01 0.01 0.07 0.07	-0.21 -0.22 -0.05 -0.05 -0.15 -0.20 -0.21	Total Enroll. Forced	61 P 52 I 75 H 54 C	ot Roll wrf Lab nd Lau rs Phy Sci Lass Assign ect Disc atisfaction	0.18 9.47 0.53 0.57 0.70	0.03 0.14 0.27 0.62 (0.42	0.03 0.11 0.11 0.06 0.06 0.05 0.05	0.18 0.96 -0.12 -0.21 -0.21 -0.23 0.22
	57 Auto Tut 15 Type 1-0r 16 Type 0r 17 Dye 0r 34 Tot Roll 16 Perf Lab 52 Ind Lab 57 Auto Tut	0.50 0.05 0.12 0.17 0.10 0.10 0.47	0.25 0.00 0.01 5.03 0.04 0.11 0.22 0.27	0.00 0.01 0.01 0.01 0.07 0.11	0.25 -0.25 -0.25 -0.15 -0.25 -0.25 -0.25		10 17 17 17 61 IN 52 In 73 34	ype Jedr ype dr ype dr ype dr erf Lab ed Lab stisfection ect Disc es Phy doi	0.03 0.05 0.05 1.37 0.51 0.51 0.61	0.00 0.00 0.00 0.14 9.26 9.31 0.48 0.44	0.00 0.12 0.65 0.05	0.03 -0.00 -0.00 -1.0 -0.1 -0.2 -0.2 -0.2
						Total Enroll. Forced	1/2 7/2 17 7/2 34 70 61 Per 52 In 75 Rr 54 C1	ope J-Pr ope Jr ope Fr it Foll orf Lab od Lab os Phy Sci and Assign ort Class	0.07 0.07 0.07 0.41 0.41 0.75 0.59 0.64 0.68		0.00 0.04 0.13 0.13 0.05 0.05	20 (20 (20 (20 (20 (20 (20 (20 (20 (20 (



TABLE 50 Continued

 $\overline{\text{Plains (N = 225)}}$

	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	52 Ind Lab 61 Perf Lab	0.42	0.17 0.23	0.17 0.10	-0.42 0.22
Total Enroll. Forced	34 Tot Roll 52 Ind Lab 61 Perf Lab	0.12 0.44 0.54	0.19 0.19 0.29	0.01 0.18 0.10	0.12
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 52 Ind Lab 61 Perf Lab	0.03 0.05 0.14 0.43 0.54	0.00 0.00 0.02 0.15 0.29	0.00 0.00 0.02 0.16 0.10	0.03 0.02 -0.09 -0.12 0.22
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 52 Ind Lab 61 Perf Lab	0 03 0.05 0.14 0.20 0.46	0.00 0.00 0.02 0.04 0.21 0.31	0.00 0.00 0.02 0.02 0.17 0.10	0.03 0.02 -0.09 0.12 -0.42 0.22

Southeast (N \approx 363)

	Variable to.	Mul-Iple R	9 Square	8.42 Change	Simple R
All Variables Free	61 Perf Lab 52 Ind Lab	9.50 9.55	5.25 5.30	0.25	0.50
Total Enroll. Forced	34 Tot Poll 61 Perf Lab 52 Ind Lab	0.14 0.50 0.56	0.02 0.25 0.31	0.02 0.23 0.06	0.14 0.50 -0.02
School Type Forced	15 Type J-Sr 16 Te Sr 17 Type Jr 61 Perf Lab 52 Ind Lab	0.05 0.06 0.14 0.51 0.56	0.00 0.00 0.02 0.26 0.31	0.00 0.02 0.24 0.06	0.05 0.01 0.02 0.50 -0.02
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Ir 17 Type Jr 34 Tot Roll 61 Perf Lab 52 Ind Lab	0.05 0.06 0.14 0.19 0.51	0.00 0.02 0.04 0.26 0.32	0.00 0.02 0.02 0.22 0.06	0.05 0.01 0.02 0.14 0.50

	Variable No. and Abbrev.	Mt.ltiple R	P Square	RSQ Change	Simple R
All Variables Free	61 Perf Lab 52 Ind Lab	0.33 c.50	0.11	0.11	0.33
Total Enroll. Forced	34 Tot Roll 61 Perf Lab 52 Ind Lab	0.07 0.34 0.50	0.01 0.11 0.25	0.01 0.11 0.14	0.07 0.33 -0.24
School Type Forced	15 Type J-Gr 16 Type Sr 17 Type Jr 61 Perf Lab 52 Ind Leb	0.03 0.03 0.06 0.34 0.50	0.00 0.00 0.00 0.11 0.25	0.60 0.00 0.00 0.11 0.14	-0.03 0.03 0.01 0.43
School Type & Total Enroll. Forced	15 TypSr 16 Typa 3r 1 Typa 3r 3k // Aoli 61 Perf Lab 52 Ind Lab	0.03 0.03 0.06 0.09 0.34 0.51	0.00 0.00 0.00 0.01 0.12 0.26	0.00 0.00 0.00 0.00 0.11 0.14	-0.03 0.03 0.01 0.07 0.33 -0.24



high of about 3.15 in the Mideast. The values are in the "2nd most important" range. See Table 40, p65.

Teacher Ranking of Lecture-Discussion as Important Learning Activity had a positive correlation ($\alpha \leq 0.001$) with

+Teacher Ranking of Tes Scores as Important Grading Method (all eight regions)

and negative correlation ($\alpha < 0.001$) with

-Teacher Ranking of Student Performance in Laboratory as Important Grading Method

-Teaching Experience Using Physical Science SCIP Materials

These results can be interpreted to mean that those teachers who favor use of lecture-discussion for learning activities tend to favor the use of test scores for grading. They tend to consider laboratory performance of lesser importance. Also the teacher using SCIF materials for teaching physical science tend not to rank lecture-discussion as high as those teachers using other than the SCIP materials.

The best predictors of Teacher Ranking of Lecture-Discussion as Important Learning Activity were the rankings for lecture as Important learning activity and for use of test scores for grading. See Table 46, p69.

Those teachers who ranked lecture high tended to rank lecture-discussion lower and visa versa. This is a result to be expected due to the interdependence of the rankings. A high ranking for either lecture or lecture-discussion was also related to a preference for use of test scores as a grading criterion and lower rankings for importance of laboratory performance as a grading criterion.

Science Demonstrations

The mean for Teal or Ranking of Science Demonstrations as Important Learning Activity ranged from a low of about 1.10 in the Plains and Farwest to a high of about 1.50 in the Mideast. These rankings are in the "used" to "3rd most important" range. See Table 41, p65.

Teacher Ranking of Science Demonstrations as Important Learning Activity had a positive correlation ($\alpha \leq 0.001$) with

+Toacher Ranking of Student Participation in Class as Important Grading Method

and negative correlation ($\alpha \leq 0.001$) with

-Use of Science Course Improvement Projects

The teacher who ranked science demonstrations high also ranked the importance of student participation in class for grading purposes high.



Teachers who had used SCIP materials, particularly in biology at the tenth grade level, considered science demonstration to be of less importance than other teachers.

There were no consistent predictors of the rank of importance of science demonstrations across the regions. The most frequent predictor was Biology Course Chosen for This Survey. The weight of this variable in prediction of science demonstration importance was negative and appeared most consistently in the Farwest, Rocky Mountains, Plains, and Southeast regions. In those schools sampled, when the selected teacher was a biology teacher, the rank of importic se for science demonstrations was lower than for teachers of other science areas. See Table 47, p71.

Instructional Films

The means for Teacher Ranking of Instructional Films as Important Learning Activity ranged from a low of about 0.85 in the Rocky Mountains region to a high of about 1.10 in the Farwest. These rankings were in the "not used" category. See Table 42, p65.

Teacher Ranking of Instructional Films as Important Learning Activity had a positive correlation ($\alpha \leq 0.001)$ with

Use of Motion Pictura Projector

Those teachers which used films tended to rank their importance higher than those who did not use films. There were no negative correlates.

The most frequent predictors of Teacher Ranking of Instructional Films as Important Learning Activity were the Use of Motion Picture Projector and Teacher Ranking of Excursions and Field Trips as Important Learning Activity. There appears to be a tendency for teachers who favor an outside media source for learning activities to fevor more than one such activity. In the Great Lakes, Mideast, and Plains regions the importance of films and add trips were related. In the New England region the best predictor of the ranking for films was the ranking for programmed instruction. Perhaps ome teachers or schools could be identified as "Innovative" or as situations where a variety of resources beyond the teacher and the textbook are considered of high importance. See Table 48, pp.3.

Individual Laboratory Activity

The means for Teacher Ranking of Individual Latoratory Activity as Important Learning Activity ranged from a low of about 1.00 in the Southeast to a high of about 1.60 in the Kocky Mountains and Great Lakes regions. These rankings are in the "not used" to "3rd most important" range. See Table 43, p65.

Teacher Ranking of Individual Laboratory as Important Learning Activity had positive correlation (a < 0.00) with

*Teacher Ranking of Student Performance in Laboratory as Important Grading Mathod (all eagle regions)



*Teacher Satisfaction with Science Teaching as a Career

Those teachers who considered individual laboratory activities important also considered student performance in the laboratory as an important criterion for grading. These teachers also tend to be more satisfied with teaching as a career than teachers who did not rank individual laboratory activities high. Less than 8 percent of the responding teachers indicated any dissatisfaction with teaching as a career. There were no negative correlates other than those learning activity rankings previously mentioned.

Group Laboratory Activity

The means for Teacher Ranking of Group Laboratory Activity as Important Learning Activity ranged from a low of about 1.75 In the Southeast to a high of about 2.25 in the Farwest. These rankings are in the "3rd most important" to the "2nd most important" range. See Fable 44, p69.

Teacher Ranking of Group Laboratory as Important Learning Activity had a positive correlation ($a \leq 0.001$) with

Teacher Ranking of Student Performance in Laboratory as Important Grading Method (all eight regions)

Teachers who favored group laboratory activities also considered student performance in the laboratory as an important grading criterion. There were no negative correlates other than the rankings of other learning activities previously discussed.

The relationship between the rankings of individual laboratory and group laboratory are negative due to the dependence in the ranking procedure. The best predictor of either the group or individual laboratory rankings was the Teacher Ranking of Student Performance in Laboratory as important Grading Method. This was true for all regions. Tracher's preference for laboratory activities and preferences for evaluation criteria for students were consistent. See Tables 43, p75, and 50, p77.

Teacher Rankings of importance of Grading Methods

The teachers were asked to rank grading methods according to their importance in secondary science courses. The grading methods included were

Test Scores
Written Assignments
Student Participation In Class Discussion
Student Performance in Laboratory Activity
Student Performance in Science Projects
Student Interest in Science



From these grading methods, the ranking for four were chosen for further analysis. These were

Test Scores Written Assignments Student Participation in Class Discussion Student Performance in Laboratory Activity

These were chosen on the basis of the rankings obtained from the teachers. The teachers were asked to rank each grading method as "most often used," "2nd most often used," "3rd most often used," "used," or "not used." If a grading method was ranked "used" or "not used" by 85 percent or more of the teachers it was not considered for further analysis. This means that only those grading methods ranked in the top three by at least 15 percent of the teachers were considered for further analysis.

The means and standard deviations for the Teacher Rankings of 'es, Written Assignments, Student Participation in Class Discussion, and a Performance in Laboratory Activity as Important Grading Methods are given in Tables 51, 52, 53, and 54.

TABLE 51

MEANS^a AND STANDARD DEVIATIONS FOR TEACHER RANGING OF TEST SCORES

AS IMPORTANT GRADING METHOD

	Great Lakes	Farvest	New England	Mideast	Southwest	Rocky Mountain,	Plates	Southeast	Total U.S
Sean	1, 45	3.28	1.54	2.54	V. 70	1.00	1. 40	1, 26	3, 35
S.D.	1.04	1.08	0.99	1.05	1.15	1.29	1.10	1.75	1,11
N	454	309	1.16	430	180	85	221	357	2162

TABLE 52

MEANS^a AND STANDARD DEVIATIONS FOR TEACHER RANKING OF WRITTEN ASSIGNMENTS

AS IMPORTANT GRADING METHOD

	Great Lakes	Farwest	New Englast	Miderat	Southwest	Rocky Mountains	Plains	Southeast	Toor U.S
Mean	1.92	2.15	1.29	1.57	2.12	2.27	2.05	1.87	1.83
S.D.	1.37	1.22	1.25	1.70	1.37	7.16	1.30	1.35	1.10
N	454	309	126	4 30	180	٤5	221	357	2162



TABLE 53

MEANS^a AND STANDARD DEVIATIONS FOR TEACHER RANKING OF STUDENT PARTICIPATION
IN CLASS DISCUSSION AS IMPORTANT GRADING METHOD

	Great Lakes	Farwest	New Frelland	Mideast	Southwest	Rocky Mountains	Plains	Southeast	Lotal U.S
Mean	1.11	0.75	1.39	1.49	1.04	0.84	0.91	1,44	1.17
S.D.	1.23	1.55	1.28	1.45	1.30	1.08	1.13	1,35	1.27
N	454	309	176	440	180	85	221	357	2162

TABLE 54

MEANS^a AND STANDARD DEVIATIONS FOR TEACHER RANKING OF STUDENT PERFORMANCE
IN LABORATORY ACTIVITY AS IMPORTANT GRADING METHOD

	Great Lakes	Farvest	New England	Mideasi	Southwest	Racky Mountains	l, l a t u a	Southeast	Total U.S
Mean	2.32	2.50	2.48	2.13	2.22	2.06	2.14	1.79	2.19
5.D.	1.25	1.25	1.23	1.37	1.21	1.47	1.28	1.48	1.34
N	454	1(1)	126	430	180	85	221	357	2162

Each of the four grading methods variables was used as the dependent variable in separate stepwise regression analyses. The results of these analyses are given in Tables 55, 56, 57, and 58.

In the following section the results for each of the four grading methods will be presented and discussed. The results will include the descriptive information, the correlates and the regression analyses.

The intracorrelation of the rankings of the grading methods were directly effected by the ranking process. The selection of one activity as the "most used" automatically eliminated it as being ranked in any other category. Therefore these variables are not independent. This lack of independence does influence the correlation coefficients. The intracorrelations are all either not significantly different from zero or negative (a ≤ 0.001) without any correction for lack of independence.

Test Scores

The means for Teacher Finking of Test Scores as Important Grading Method were very uniform across regions. The rankings range from a mean of about 3.00 in the Rocky Mountains to about 3.50 in the New England region. These means represent a ranking of "2nd most used" to "most used." See Table 51, p82.



TABLE 55

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHER RANKING OF TEST SCORES AS IMPORTANT GRADING METHOD

84

	Variable No.	Hultiple	R	RSQ	Simple 8	l	Variable No.	Hultiple	R Square	PSQ Change	Simple S
All Variables	and Abbrev.	я 0.33	5quare 0.11	Change 0.11	и 0.33	All Variables		0.39	0.13	0.13	a, 15
Free			2.01	0.00	0 01	Free	47 Dectire	0.63 0.63	0.18 0.00	0.05 0.∞	C. '
Total Enroll. Forcel	34 Tot Roll 45 Lect bisc	0.01 0.33	0.∞ 0.11	0.11	0.33	Forced		0.15	3.15 0.15	0.12	0.7 0.17
detwei Type Forced	15 Type Jetr 10 Type Set	0.00	0.00 0.03 (0.03	70.0 70.0 70.0	0.00 0.14 -0.15		15 Type (-2r 16 Type or	2.04	3.00 3.30	0.00 0.00	9.74
	17 Type to 40 Leaf lan	3. %	0.13	0.10	૦.સ	75.00	17 Type Jr 48 Lect Disc	€.** €. •.	0.00	0.00	0.35
Poince Type & Total Enroll. Forced		C.00 3.17 3.17	0.00	ი.00 ი 03 ი.ბა	0.30 -0.14 -0.15	School Tyte &	15 Dipe delle lo	0.42	0.18 0.00	0.05	0.18
. 01000	34 Tot Roll 48 Lect Disc	0.17 3.36	0.03	0.00	3.03 5.33	Total Enroll. Forced	10 Type 3r 17 Type Jr	0.04 0.07 0.07	0.00 20.0	0.00 0.00 0.00	-0,62 0.01 0.01
							34 Tot Poli 48 Lec. Disc 57 Lecture	0.36	0.13	0.13	0.15
Parmoet	(N - 309)					Southwest	(N 182)			-	
rarwese	Variable %.	Multiple	s	P3 4	Simple	Southwest	Variable No.	Multiple	я	R5Q	Stmpl
	and Abbrev.	8		Change 1.11	્ર્ય ઉ.⊋	All Variables	and Abbrev.	0.36	5quare 0.13	Change 0.11	n.36
All Variables free	चति i≠ct Disc	0.12	0.11			Free	47 Lecture 60 Fart Class	0.44	0.10	0.07	0.16 -0.20
Total Enroll. Forced	ju fot koll He Gest Diss	0.11 3.75	2. 1 3. 11	5.01 3. 1 3	11. ° ايل	Total Enroll.	NG TO POST	0.09	0.01	0.01	-0.09 0.36
School Tyre Forced	15 Dyne (-)e 10 Dyne de	v.21	1,20 1,30	.).04	1 1		47 Lecture 60 Part Class	0.45	0.25	3.00 0.05	0.16 -0.20
	17 Type Ir 48 Sect Size	2.30	2.1.	3.10 3.10	3.3	School Type Forced	15 Type 1-8r	0.05 0.06	0.00 0.00	0.00	-0.05 0.00
School Type & Total Enroll.	15 Dype Jedr In Dype Jr In Oype Jr	9.41 3.43	0. % 0.2•	0.0	5.31 5.1*		17 Type Jr 48 Lect Disc 47 Lecture	0.10 0.39 0.46	0.01 0.1* 0.21	ა.მ1 ა.14 ი.მნ	0.00 0.36 0.16
Forced)" Type Ur 3+ Tot Poll +6 Lect Disc	0.21 0.22 0.38	1.35	0.4 0.00 0.10	-0.21 11 0.32	1	60 Part Class	0.51	0.16	0.05	-0.20
							15 Type J-Sr 10 Type Cr 17 Type Jr	0.0* 0.05 0.16	0.00 5.00 9.01	0.00 0.00 0.01	-0.05 0.00 0.00
						, 3.33	34 Tot Roll 48 Lect Disc	0.15	0.02 3.15	0.01	-0.09 0.3
							47 Lecture 60 Part Class	0.46 3.91	0.26	0.05 0.05	0.16 -0.20
New Engl	Land (N =	130)		-	·	Rocky Mou	ntains (N	85)			
	Variable Eo. ami Abbrev.	Multiple R	3quare P	FSQ Change	Simple B		Variable No. and Abbrev.	Multiple R	fi Square	RSQ Change	Simple R
	48 Lect Disc 47 Lecture	0.50 0.59	0.25	0.25	0.50	All Variables Free	48 Lect Disc 47 Lecture	0.40		0.16 0.06	0.40 0.21
free	83 CO PS TE	0.62	0.39	0.35	-0.25		03 NDEA EQ 05 NDEA REMOD 04 ESEA EQ	0.51 0.58 0.62	0.33	0.04 0.07 0.06	0.53 -0.21 -0.03
Total Enroll. Forced	34 Tot Roll 48 Lect Disc 47 Lecture	0.05 0.50 0,59	0.00 0.25 0.34	0.00 0.25 3.09	0.05 0.50 0.22		69 COOP Staff	5.67	0.45	0.06	0.17
	83 SCIP NO TE	0.62	0.39	0.05	-0.25	Total Enroll. Forced	34 Tut Roll d Steet Dixe N9 COOF Staff	0.01 0.40 0.47	0.00 0.16 .22	0,00 0.15 0.05	0.03 0.40 0.17
Sabool Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr	0.07 0.19 0.19	0.50 0.54 0.54	0.00 0.00 0.00	-0.17		05 MOSA 15 5 31 July 1 2 7 11	0.54 0.60	0. w	0.07 0.07	-0.21 0.21
	48 Lecture	0.53 0.61	0.37 0.37	0.24	7.1		04 1-71 1-4	0. 6 ₹ 0.68	0.47	0.07	-0.03
Sahool Type & Sotal Enroll.	15 Type J-Sr 15 Type Sr	0.07 0.19	0.30 0.34	5.00 9.01	. •	School Type Forced	15 Dyne Jede 16 Tale 16	3.46	ე.01 ე.თ	0.01	-0.12 3.14
forced	17 Type ir 34 tot Roll	0.17	0.7• 0.5•	0.00 0.00 0.24	-0.2"	1	17 Type in Will Sect Disc 69 THP Innii	0.19 0.44 7.50	0.04 9.19 2.27	0.01 0.15 0.2	-0.09 -0.40 17
	48 Lect litro	3.53 0.61	0.15	0.34	9.20		05 NEW JOY 1 03 NDEW E4 62 Set Proj	3.58 0.52 0.66	0.44 ०.भ ७.५३	0.07 0.04 0.05	-0.31 -21.77
						dahool Type \$	16	0.12	٦. ١١	0.05	12
						Total Far 11. Forced	15	3.1e 3.19	3.32		1.14
										1.5	
							69 (74.5) 74.5 (65.) 75.4 (7.5)	1 *	0.19	0.15 0.08 0.09	



TABLE 55 Continued Plains (N = 225)

		riable No. 1 Abbrev.	Multiple R	R Square	RSQ Change	31ssple k
All Variables Free	12 48	Poli Geol Lect Disc	0.29	0.09 0.15	0.09 0.06	-0.29 0.27
Total Enroll. Porced	34 12 48	Tot Sall Roll Geol Lect Disc	0.09 0.10 0.39	0.01 0.09 0.15	0.01 0.08 0.06	-0.09 -0.29 0.27
School Type Forced	15 16 17 09	Type J-Sr Type Sr Type Jr Roll Chem	0.76 0.20 0.20 0.36	0.00 0.04 0.04 0.13	0.00 0.04 0.00 0.09	0.06 0.14 -0.19 -0.24
School Type & Total Enroll. Forced	15 16 17 34 09	Type J-Sr Type Sr Type Jr T t Roll Roll Chem	0,06 0,20 0,20 0,22 0,40	0.00 0.04 0.04 0.05 0.16	0.00 0.04 0.00 0.01 0.11	0.06 0.14 -0.19 -0.09 -0.24

	160		
Southeast		~	363)

	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simp) •
All Variables Free	49 lect Disc 47 Lecture	0.34	0.11 0.18	0.12 0.06	0.14
Total Enrol). Forced	34 Tot Poll ed Lect Disc 47 Lecture	0.01 0.34 0.42	0.00 0.11 0.18	0.00 0.11 0.06	-0.01 0.44 0.20
School Type Forced	1° Type J-Jr lb Type Sr 17 Type Jr 48 Lect Disc 47 Lecture	0.07 0.16 0.19 0.35 0.41	0.01 0.02 3.03 3.13 3.19	0.01 0.02 0.01 0.10 0.06	-0.07 -0.14 -0.14 -0.34 -0.20
Tohool Type & Total Enroll. Forced	15 Type Cor 16 Type Sr 17 Type Cr 34 Tot Boll 48 Lect Disc 47 Lecture	0.07 0.16 0.18 0.18 0.36 0.43	0.01 0.02 0.03 0.13 0.19	0.01 0.00 0.01 0.00 0.10 0.06	-0.07 0.16 -0.14 -0.01 0.01

		riable Ho. L'Abbrev.	Multiple R	P Square	RSQ Change	Simple R
All Variables Free	48 47	Lect Disc Lecture	0.34 0.41	0.12 0.17	0.12	0.34
Total Enroll. Forced		Tot Roll Lect Disc Lecture	0.34 0.41	6.00 9.13 0.17	0.00 0.12 0.05	0.02
School Type Forced	15 16 17 48	Type J-Sr Type 3r Type Jr Lect Disc	0,60 0,12 0,12 0,35	0.00 0.01 0.02 0.13	0.00 0.01 0.00 0.11	-0.00 0.11 -0.12 0.34
School Type & Total Enroll. Forced	15 15 17 3+	Type J-Sr Type Sr Type Jr Tot Roll Leat Disc	0.00 0.12 0.12 0.12 0.35	9.00 0.01 0.02 0.13	0.00 3.01 5.00 0.00 0.11	-0.00 0.11 -0.12 0.02 5.34



TABLE 56

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHFR
RANKING OF WRITTEN ASSIGNMENTS AS IMPORTANT GRADING METHOD

Creat L	akes (N	459)		7		Mideast	(N 433)	* * * * * * * * * * * * * * * * * * * *			
	Variable No. and Abbrev.	Multiple R	g Square	93Q Change	Simple R		Variable No. and Abbrev.	Multiple R	5q - a	RSQ Charge	Simple R
All Variables	54 Class Assign 60 Part Class	0.5	0.07 6.11	0.07 0.05	0.26 -0.18	All Variables Free	51 Perf Lab 60 Part class	∩. 14 ∂. 40	0.12 0.21	0.12	-0.1, -0.21
Total Enrull. Forced	34 Tot Roll 54 Class Assign 60 Part Class	0.01	0. 1 0.11	0,00 0,07 0,05	0.03 0.26 -0.18	Total Enroll. Forced	94 lot Poll 61 Perf Lab 10 Part Class	0.06 0.19 0.46	0.50 2.12 3.44	0.60 6.12 9.66	-0.0% -0.0% -0.21
School Type Forced	15 Type J-3r 16 Type Jr 17 Type Jr 54 Clase Assign	0.02 0.36 0.67 0.27	0.00 0.00 6.01 0.07	9,00 3,00 2,50 9,07	-0.02 0.06 -0.01 0.25	Screed Type Forced	15 Type J-'r 16 Type Gr 17 Type Jr 61 Ferf Lab 60 Fart Class	0.03 0.34 0.75 0.40	3.00 3.31 9.01 9.12 9.21	0.00 0.01 0.00 9.11 0.09	0,01 -0,07 -0,08 -0,74 -0,23
	15 Type dear 10 Type Fr 17 Type Fr 34 Tot Boll 54 Class trough	0.02 0.06 0.07 0.07	0.00 0.00 0.01 0.01 0.07	0.00 0.00 0.00 0.00 0.07	0.00 9.00 -0.01 9.01 9.01 0.05	School Type & Total Enroll.	15 Type (-)r In Type Ir 17 Type Ir 18 Tot Roll 61 Perf Lab 60 Part Class	0.03 0.03 0.03 0.09 0.35 0.46	0 0.01 0.01 0.01 0.12	0.00 0.01 0.00 0.00 0.11 0.0,	0,03 -0,04 0,75 -0,14 -0,31
Farwest	(% ')9)					Southwes	t (N 182)			
	€: - 1	a >1•	.quare	PIC Stange	Simple		Variable No. and Abbrev.	Multiple R	g Square	R5Q Change	Simple A
All Variables Free Yotal Enr. 11.	≪6 20	0.27 0.45 0.14	1,07 2,12 2,02	0.07 0.05 0.07	0.27 -0.21 -0.11	All Variables Free	54 Class Assign 60 Part Class 61 Perf Lab	0.35 0.47 0.55	0.1 2 3.22 7.30	0.17 0.10 0.03	0.35 -0.35 -0.27
orced	The similar out that the similar out the simil		0.5° 0.1° 0.5°	2.01 2.01	31.27 -01.21 -01.21	Torced	34 Tot Poll 54 Class Assign 60 Part Class 61 Perf Lab	0.09 0,36 0,48 0,55	0.01 0.13 0.23	0.01 0.12 0.10	-0.09 0.35 -0.35
orced	ass Assign	0.15 0.15 0.35 0.39	5,23 3,09 9,15	3.51 3.7 9. t	-0.27	School Type Force:	15 Type J-Gr 14 Type Jr 17 Type Jr 54 Class Assign		0.30 0.00 0.00 0.30 0.13	0.00 0.00 0.00 0.00	-0.27 0.00 0.02 -0.02 0.35
ahool Type utal Faro. orced	Type J-Sr Dype Or 17 Dype Or 14 Tot Roll 54 Class Assign 50 Part Class	5.56, 2.15, 5.17, 5.20, 6.31, 6.39	1,00 0,02 1,04 1,04 1,10 0,15	9,90 9,32 5,01 9,01 3,06 9,06	-0.07 -0.12 -0.17 -0.13 -0.27 -0.21	School Type & Total Enroll.	60 lines 61 lab 15 Type J-Sr 16 Type Jr 17 Type Jr 34 Tot Roll 94 Class Assign 60 Part Class 61 Perf Lab	- 20	0.21 0.00 0.00 0.00 0.00 0.01 0.14 0.23	0.10 0.09 0.00 0.00 0.00 0.00 0.10 0.10	0.00 0.02 -0.09 0.02 -0.09 0.35 -0.09
ew Engl	and (N 1	30)				Rocky Mo	untains (N	85)	· · · · · · · · · · · · · · · · · · ·		
	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple B		Variable No. and Abbrev.	Multiple	R Square	RSQ Change	Simple R
ll Variables	61 Perf Lab 34 Tot Roll	0.36	0.13 0.29 0.00 0.11	0.13 0.16 0.00 0.12	-0.36 -0.33 0.05 -0.36	All Variables Preo	13 Roll Phys Sci 61 Perf Lab 86 Course Earth 73 Satisfaction 69 COOP Staff	0.29 0.43 0.52 0.57 0.63	0.09 0.19 0.27 0.33 0.40	0.09 0.10 0.08 0.06 0.07	0.29 -0.21 -0.29 -0.27
chool Type	60 Part Class 61 Perf Lab 15 Type J-3r 16 Type Sr 17 Type Jr 60 Part Class 61 Perf Lab	0.35 0.54 0.25 0.25 0.25 0.25	0.19 0.06 0.06 0.06 0.09 0.19	0.06 0.06 0.00 0.00 0.14 0.12	-0.33 -0.25 -0.14 -0.06 -0.16 -0.33	Total Enroll. Forced	3% Tot Roll 13 Boll Phys Sci 61 Perf Lab 86 Course Earth 46 Class 69 CCOP staff 73 Sattsfaction	6.22 3.36 3.36 3.34 3.38 3.62	0.05 0.13 0.21 0.29 0.44 0.45	0.05 0.08 0.08 0.08 0.08 0.05 0.05	0.17 -0.29 -0.21 -0.29 -0.16 0.17 -0.57
nhool Type & otal Enroll. orded	IS Type J-Sr Type dr T	ე. 45 ე. 56 ე. ბ ბ	0.05 0.36 0.37 0.20 0.32 0.6	0.06 0.00 0.00 0.01 0.17 0.10 0.09 0.05	9.25 -0.19 -2.09 1.05 -0.35 -0.35 -0.15 -0.21	Sahool Type Forced	15 Type J-dr 16 Type Sr 17 Type Jr 86 Course Earth 73 Satisfaction 40 NOF INDER/ 89 NOF 66 Set Fac	0.07 0.25 0.25 0.25 0.25 0.50 0.60 0.60	0.01 0.05 0.07 0.20 0.11 0.36 0.41	0.01 0.06 0.00 0.13 0.07	-0.07 -0.21 -0.25 -0.29 -0.25 -0.1 -0.26
							th Dise r 17 Dype or 34 Tot Bull do Jourse samth 73 Sattefaction 69 COOP staff 61 Perf tab	0.25 0.26 0.26 1.11 1.57 0.53 0.57 0.61	0.01 0.06 0.07 0.10 0.25 0.28 0.38 0.45	0.06 0.00 0.03 0.03 1.05 0.04 0.05	-0.307 -0.31 -0.32 -0.32 -0.37 -0.37 -0.37 -0.39



TABLE 5		<u>-1</u>			
Plains	$(N \approx 225)$				
	### Variable Bo. and Albrev. R Square Change R All Variables 60 Part Class 0.33 0.11 0.11 -0.3 5% Class Assign 0.44 0.19 0.09 0.2 5% Class Assign 0.44 0.19 0.09 0.2 5% Class Assign 0.44 0.19 0.09 0.2 5% Class Assign 0.44 0.19 0.09 0.2 5% Class Assign 0.44 0.19 0.09 0.2 5% Class Assign 0.45 0.13 0.11 0.11 -0.3 5% Class Assign 0.45 0.19 0.09 0.2 10 Roll Physics 0.50 0.25 0.06 -0.1 10 Roll Physics 0.50 0.25 0.06 -0.1 10 Roll Physics 0.50 0.25 0.06 -0.1 17 Dyps Sr 0.06 0.00 0.00 0.00 0.00 17 Dyps Sr 0.06 0.00 0.00 0.00 0.00 17 Dyps Sr 0.06 0.00 0.00 0.00 0.00 17 Dyps Sr 0.06 0.00 0.00 0.00 0.00 17 Dyps Sr 0.06 0.00 0.00 0.00 0.00 0.00 0.00 0.0			Simple R	
All Variables Proc	54 Class Assign	0.44	0.19	0.09	-0.33 0.29 -0.18
Total Enroll. Forced	60 Part Class 54 Class Assign	0.33	0.11 0.19	0.11	0.02 -0.33 0.29 -0.16
School Type Forced	-16 Type Sr 17 Type Jr 60 Part Class 54 Class Assign	0.06 0.09 0.33 0.45	0.00 6.01 0.11 0.20	0.00 0.00 0.10 0.09	0.06 -0.00 -0.05 -0.33 0.29
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 60 Part Cluse	0.06 0.06 0.09 0.10 0.34	0.00 0.00 0.01 0.01 0.11	0.00 0.00 0.00 0.00	0.06 -0.02 -0.05 0.02 -0.33 -0.16
Southeas	### Alb variables 60 Part Class 0.33 0.11 0.11 -0.5				
	Variable No. and Abbrev.				Simple R
Semool Type					-0.23
	54 Class Assign 60 Part Class	o6 o1	0.13 0.17	0.13	0.36
	16 Type Sr 17 Type Jr 54 Class Assign 60 Pert Class	0.16 0.20 0.18 0.44	0.02 0.04 0.15 0.19	0.02 0.01 0.11 0.05	-0.13 0.19 0.36 -0.23
Total Enroll.	16 Type Gr 17 Type Jr 34 Tot Roll 54 Class Assign 60 Pert Class	0.16 0.20 0.20 0.38 0.44	0.02 0.04 0.04 0.15 0.19	0.02 0.01 0.03 0.11 0.05	-0.13 0.19 -0.03 0.36 -0.23
All Regi	Tree Sh Class Assign				
	Variable No.	Multiple	R	RSQ	Simple R
All Variables Free	.60 Pert Class	0.39	0.15	0.06	-0.26
Total Enroll. Forced	54 Class Assign 60 Part Class 61 Perf Lab	0.30	0.09 0.15	0.09	0.30 -0.26
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 54 Class Assign 60 Part Class 61 Perf Lab	0.00 0.06 0.07 0.30 0.39 0.47	0.00 0.00 0.00 0.09 0.15 0.22	0.00 0.00 0.08 0.07	0.00 -0.05 0.07 0.30 -0.26 -0.24
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 54 Class Assign 60 Part Class	0,00 0.06 0.07 0.08 0.30 0.39	0.00 0.00 0.00 0.01 0.69 0.16	00.0 00.0 60.0	0.00 -0.05 -0.07 -0.04 -0.30 -0.26



SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHER RANKING OF STUDENT PARTICIPATION IN CLASS

TABLE 57

AS IMPORTANT GRADING METHOD

Variable No.	Multiple	R	R5Q	Simple		Variable No. and Abbrev.	Multiple R	Эсимле	RSQ Change	Simple A
and Abbrev.		oquere	Change	, , , , , , , , , , , , , , , , , , ,	All Variables	49 Sci Demo	0.24	0.06	0.06	0.24
34 Tot Roll	0.34	0.00	0.00	0.04	Total Enroll.	74 Tot Roll ol Perf Lab 59 Writ Assign	0.03 0.25 0.39	0.00 0.06 0.15	0.00 0.06 0.09	0.03 -0.24 -0.21
15 Type J-Sr 16 Type Sr 17 Type Jr	0.00 0.07 0.09	0.00 0.00 0.01	0.00 0.00 0.00	-0.00 -0.05 0.04	School Type Forced	15 Type U-Sr 15 Type Er 17 Type Jr	0.04 0.09	0.00 0.01 0.01	0.00 0.01 0.00 0.06	0.04
15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll	0.00 0.07 0.09 0.11	0.00 0.00 0.01 0.01	0.00	-0.00 -0.05 0.04 0.04		59 Writ Assign 61 Perf Lab	0.33	0.11	80.0	-0.21 -0.24
					Total Enroll.	15 Type Sr 17 Type Jr 34 Tot Roll 61 Perf Lab 59 Writ Assign	0.09 0.09 0.11 0.26 0.40	0.01 0.01 0.01 0.07 0.15	0.01 0.00 0.00 0.05 0.10	-0.09 0.07 0.03 -0.24 -0.21
$(N \simeq 309)$					Southwes	t (N ~ 182)			
Variable No. and Abbrev.	Multiple R	9 Square	PSQ Change	Simple F		Variable No. ani Abbrev.	Multiple R	R Bquare	PSO Change	Simple R
63 Interest 59 Writ Assign 61 Perf Lab	0.27 0.36 0.44	0.07 0.13 0.19	0.07 3.06 0.06	0.27 -0.21 -0.23	All Variables Free	59 Writ Assign 36 Age 61 Perf Lab 58 G Test	0.35 0.42 0.48 0.53	0.12 0.18 0.23 0.28	0.12 0.06 0.05 0.05	-0.35 0.29 -0.12 -0.21
34 Tot Roll 63 Interest 59 Writ Assign 61 Perf Lab	0.02 0.27 0.49 0.44	0.00 0.07 0.13 0.19	0.00 0.07 0.06 0.06	0.02 0.27 -0.21 -0.23	Total Enroll. Forced	34 Tot Roll 59 Writ Assism 61 Perf Lab 58 G Teat	0.07 0.35 0.43 0.49	0.00 0.12 0.18 0.24	0.00 0.12 0.06 0.09	0.07 -0.35 -0.12 -0.20
15 Type J-Sr 16 Type Sr 17 Type Jr 53 Interest	0.01 0.09 0.14 0.30	0.00 0.01 0.02 0.02	0.00 0.01 0.01 0.07	0.01 -0.08 0.12 5.27	School Type Forced	36 Age 15 Type J-Sr 16 Type Gr	0.53 0.09 0.09	0.25 0.01 0.01	0.01	0.29 -0.09 0.04
5% Writ Assign 61 Perf Lab	ი. აი ი. აი ი. ი	0.1c 0.21 0.00	0.07 0.06 0.00	-0.21 -0.23		59 Writ Assign 36 Age 61 Perf Lab	0.09 0.⅓ 0.⊌ 0.50	0.13 0.19 0.25	0.12 0.06 0.06	0.02 -0.35 0.29 -0.12
16 Type Sr 17 Type Jr 34 Tot Roll 63 Interest	0.09 0.14 0.15 0.30	0.01 0.02 0.03 0.03	0.01 0.01 0.00 0.07	-0.29 0.12 0.02 0.27	School Type & Total Enroll.	50 G Test 15 Type J-3r 10 Type Sr 17 Type Jr	0.09 0.09 0.09	0.30 0.01 0.01 0.01	0.05 0.01 0.00	-0.20 -0.09 0.04 0.02
61 Perf Lab	o.¥á	0.21	0.96	-0.23		34 Tot Roll 59 Writ Assign 36 Age 61 Perf Lab 58 G Test	0.10 0.36 0.44 0.50 0.55	0.01 0.13 0.19 0.25 0.30	0.00 0.12 0.06 0.06 0.05	0.07 -0.15 0.29 -0.12 -0.20
and (N =	130)				Rocky Mo	untains (N	≈ 85)			
Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple 2		Variable No. and Abbrev.	Nultiple R	R Square	RGQ Change	fimple 3
<pre>49 Writ Assign 61 Perf Lab 74 Hrs Bio</pre>	0.36 0.48 0.53	0.13 0.23 0.28	0.13 0.10 0.06	-0.16 -0.18 0.31	All Variables	20 Sci Fair 74 Hrs Bio 70 Small Classes 29 SCIP PS Roll	0.29 0.38 0.44 0.50	0.09 0.14 0.20 0.23	0.09 0.05 0.05 0.05	-0.29 -0.16 0.19 -0.19
34 Tot Poll 59 Writ Assign 61 Perf Lab 74 Hrs Bio	0.09 0.36 0.43 0.54	0.01 0.13 0.23 0.29	0.01 0.12 0.10 0.06	-0.09 -0.36 -0.18 0.31	T. 1 Enroll.	71 Preps 37 Sex 34 Tot Roll	0.60	0.02	0.05	-0.18 -0.27 -0.15 -0.27
15 Type J-Sr 16 Type Sr 17 Type Jr 59 Writ Assign	0.05 0.06 0.06 0.39	0.00 0.00 5.00 0.15	0.00 0.00 0.00 0.14 0.09	0.05 -0.01 -0.02 -0.36 -0.18	101.4	53 Group Lab 70 Small Classes 58 O Test 29 SCIP PG Roll	0.40	0.16 0.27 0.27 0.31	0.07 0.05 0.05 0.05	-0.26 6.19 -0.15 -0.19 -0.19
74 Hrs Bio	0.55	0.30	0.09 0.06	0.31	School Type Forced	15 Type J-8r 16 Type Sr	0.20 0.27	0.04	0.0.	0.20
15 Type Sr 17 Type Jr 34 Tot Roll 59 Writ Assign 61 Perf Lab	0.06 3.06 0.11 0.39 0.49	0.60 0.01 0.01 0.25 0.24 0.30	0.00 0.00 0.01 0.14 0.09 0.06	-0.01 -0.02 -0.09 -0.16 -0.18 0.31		17 Type Jr 53 Group Leb 37 Sex 54 Class Assign 29 SCIP PC Poll	0.27 3.37 0.46 2.52 0.56 0.61	0.07 0.14 0.21 0.27 0.32 0.16	0.00 0.07 0.05 0.05 0.06	0.09 +0.26 -0.27 -0.12 -0.19
		•			School Type & Total Enroll. Forced		0.20 0.27 0.27 0.27 0.37	0.0% 0.07 0.07 0.07 0.14	0.04 0.03 0.00 0.00 0.00	0.20 0.09 0.09 -0.15 -0.26
	And Abbrev. None 34 Tot Roll 15 Type J-Sr 16 Type Sr 17 Type Jr 15 Type J-Sr 16 Type Sr 17 Type Jr 15 Type Jr 15 Type Jr 16 Type Sr 17 Type Jr 34 Tot Roll (N ~ 309) Variable Ro. and Abbrev. 63 Interest 59 Writ Assign 61 Perf Lab 15 Type J-Sr 16 Type Jr 16 Type Sr 17 Type Jr 16 Type Jr 17 Type Jr 18 Tot Roll 15 Type J-Sr 16 Type Jr 17 Type Jr 16 Type Jr 17 Type Jr 18 Tot Roll 63 Interest 59 Writ Assign 61 Perf Lab 15 Type J-Sr 16 Type J-Sr 16 Type J-Sr 16 Type J-Sr 17 Type Jr 18 Writ Assign 61 Perf Lab 19 Writ Assign 61 Perf Lab 19 Writ Assign 61 Perf Lab 19 Writ Assign 61 Perf Lab 19 Writ Assign 61 Perf Lab 19 Writ Assign 61 Perf Lab 19 Writ Assign 61 Perf Lab 74 Hrs Bio 15 Type J-Sr 16 Type J-Sr 17 Type	### Assign 0.00 130 130 130 140 150	### Rone	### Rone	None	### Abbrev. R Square Change R ### Rone	March Marc	March Marc	### Abrev. B Square Change B	### Add Abbrev. R Square Change R



TABLE 57 Continued

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ч	±έ	1.1	n	s	- (N	~	- 2	Z	כ כ)

	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables	59 Writ Assign	0.33	0.11	0.11	-0.33
Total Enroll. Forced	34 Tot Roll 59 Writ Assign	0.02	0.00 0.11	0.00 0.11	0.02 -0.33
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 59 Writ Assign 61 Perf Lab	0.02 0.04 0.09 0.33 0.40	0.00 0.00 0.01 0.11 0.16	0.00 0.00 0.01 0.10 0.05	-0.02 0.04 -0.30 -0.33 -0.15
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 59 Writ Assign 61 Perf Lab	0.02 9.94 0.09 0.09 0.33 0.40	0.00 0.00 0.01 0.01 0.11 0.16	0.00 0.00 0.01 0.00 0.10 0.05	-0.02 0.04 -0.00 0.02 -0.33 -0.15

Southeast (N ~ 363)

	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	59 Writ Assign 61 Perf Lab 68 Inservice	0.23 0.37 0.43	0.05 0.14 0.18	0.05 0.08 0.05	-0.23 -0.22 -0.18
Total Enroll. Forced	34 Tot Roll 59 Writ Assign 61 Perf Lab	0.09 0.25 0.36	0.01 0.66 3.14	0.01 0.06 0.08	-0.09 -0.23 -0.22
School Type Forced	15 Type J-3r 16 Type 3r 17 Type Jr 59 Writ Assign 61 Perf Lab 68 Inservice	0.00 5.12 5.17 5.20 6.40 5.46	0.00 0.01 0.03 0.09 0.16 0.21	0.00 0.01 0.03 0.06 0.08 0.05	-0.02 -0.09 -0.02 -0.23 -0.22 0.18
School Type & Total Enroll.	15 Type J-Dr 16 Type Dr 17 Type Jr 34 Tot Roll 59 Writ Assign 61 Perf Lab	0.02 0.12 0.17 0.18 0.30 0.40	0.00 0.01 0.03 0.03 0.09 0.16	0.00 0.01 0.02 0.00 0.06 0.07	-0.02 -0.09 0.02 -0.04 -0.23

	Variable No. and Abbrev.	Multiple R	R Square	RSQ Change	Simple R
ill Variables Pres	59 Writ Assign 61 Perf Lab	0.26 0.36	0. 07 0.13	0.07	-0.36 -0.18
Total Enroll. Forced	34 Tot Poll 59 Writ Assign 61 Perf Lab	0.01 0.26 0.36	0.00 0.07 0.13	0.00 6.07 0.06	-0.01 -0.26 -0.18
School Type Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 59 Writ Assign 61 Perf Lab	0.03 0.08 0.09 0.29 0.37	0.00 0.01 0.01 0.08 0.13	0.00 0.01 0.00 0.07 0.06	0.03 -0.08 0.05 -0.26 -0.18
School Type & Total Enroll. Forced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 59 Writ Assign 61 Perf Lab	0.03 0.08 0.09 0.09 0.28 0.37	0.00 0.01 0.01 0.01 0.08 0.13	0.00 0.01 0.00 0.00 0.07	0.03 -0.08 0.05 -0.05 -0.06 -0.18



TABLE 58

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF

TEACHER RANKING OF STUDENT PERFORMANCE IN LABORATOR $oldsymbol{Y}$ AS IMPORTANT GRADING METHOD

Great L	akes (N =	459)				Mideast	(N	~ 433)	-			
	Variable No	. Mulcipla R	R Square	RSQ Change	Simple R	,	V.	eriable No. nd Abbrav.	Multiple R	R Square	RSQ Change	Simple R
All Variables	52 Ind Lab 53 Group L	0.32 0.47	0.10 0.22	0.10 0.12	0.32 0.20	All Variables	5 5 5 5 5 5 5 6 C	Ind Lab Writ Assign		0.13 0.30 0.37	0.13 0.17 0.07	0.36 0.34 -0.34
Total Enroll	34 Tot Rol 52 Ind Lab 53 Group L	0.32	0.00 0.10 0.23	0.00 0.10 0.12	0.01 0.32 0.20	Total Enroll	-	Tot Ruli	0.65 0.01 0.36	0.42 0.00 0.13	0.05 0.00 0.13	-0.24 0.01 0.36
School Type Forced	15 Type J-5 16 Type Sr 17 Type Jr	0.07 0.07	0.00 0.00 0.00	0.00 0.00 0.00	-0.06 0.05 -0.02	.,,	52 59 . 60	Writ Assign	0.55 0.61 0.65	0.30 0.37 0.42	0.18 0.07 0.05	0.34 -0.34 -0.24
Ashaal Mass (52 Ind Lab 53 Group La		0.10	0.10	0.32	School Type Forced	15 16 17	Type Sr	0.04 0.13 0.13	0.00 0.02 0.02	0.00 0.01 0.00	-0.04 0.13 -0.08
School Type & Total Enroli. Forcad	16 Type Sr 17 Type Jr 34 Tot Roll 52 Ind Lab	0.07 0.07 0.07 0.33	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	-0.06 0.05 -0.02 0.01 0.32		53 52 59 60	Ind Lab Writ Assign	0.40 0.57 0.62 0.66	0.16 0.32 0.39 0.43	0.14 0.17 0.06 0.05	0.36 0.34 -0.34 -0.24
	53 Group La	b 0.48	0.23	0.12	0.20	School Type 6 Total Enroll. Forced		• •	0.04 0.13 0.13 0.14 0.40 0.57 0.62 0.66	0.00 0.02 0.02 0.02 0.16 0.33 0.39 0.43	0.00 0.01 0.00 0.00 0.14 0.17 0.06 0.05	-0.04 0.13 -0.08 0.01 0.36 0.34 -0.34 -0.24
Farwest	(N = 309 Variable No. and Abbrev.) Multiple R	R Square	RSQ Change	Simule R	Southwes	Val	N = 182) riable No. i Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Fram	52 Ind Lab 53 Group La	0.32 b 0.53	0.10 0.29	0.10 0.18	0.32 0.32	All Variables Free		Ind Lab Group Lab	0.31 0.51	0.09 0.26	0.09	0.31 0.30
Total Enroll. Forced	34 Tot Rell 52 Ind Lab 53 Group La	0.09 0.33 b 0.54	0.01 0.11 0.29	0.01 0.10 0.18	0.09 0.32 0.32	Total Enroil. Forced	34 52 53	Tot Roll Ind Lab Group Lab	0.24 0.39 0.53	0.06 0.15 0.28	0.06 0.09 0.13	0.24 0.31 0.30
School Type Forced	15 Type J-S 16 Type Sr 17 Type Jr 53 Group Lai 52 Ind Lab	0.17 0.17	0.00 0.03 0.03 0.12 0.30	0.00 0.03 0.00 0.10 0.17	-0.04 0.17 -0.15 0.32 0.32	School Type Forced	15 16 17 52 53	Type I-Sr Type Sr Type Jr Ind Lab Group Lab	0.06 0.14 0.33 0.51	0.00 0.00 0.02 0.11 0.26	0.00 0.00 0.01 0.09 0.16	-0.00 0.05 -0.02 0.31 0.30
School Type & Total Enroll. Forced		0.17 0.17 0.17	0.00 0.03 0.03 0.03 0.12 0.30	0.00 0.03 0.00 0.00 0.09	-0.04 0.17 -0.15 0.04 0.32 0.32		15 16 17 34 52 53	Type J-Sr Type Sr Type Jr Tot Roil Ind Lab Group Lab	0.00 0.06 0.14 0.28 0.41 0.54	0.00 0.00 0.02 0.08 0.16	0.00 0.00 J.01 0.06 0.09	-0.00 0.05 -0.02 0.24 0.31
New Engl		130)				Rocky Mou				0.29	0.12	0.30
	Variable No. and Abbrev.	Multipla R	R Square	_	Simple K			lable No. Abbrev.	Multiple R	R Square		Simple R
ll Variables Tae	59 Writ Assi 60 Part Clas 52 Ind Lab 53 Group Lab	0.46 0.56 0.66	0.11 0.21 0.31 0.43	0.11 0.10 0.10 0.12	-0.33 -0.18 0.33 0.29	All Variables Free	53 19 49	Ind Lab Group Lab Sci Club Sci Demo	0.50 0.65 0.69 0.72	0.25 0.42 0.47 0.51		0.50 0.36 0.30 -0.37
Cotal Enroll. Corcad Chuol Type	34 Tot Roll 59 Writ Assi 60 Part Clas: 52 Ind Lab 53 Group Lab 60 Class Ø 15 Type J-Sr		0.00 0.11 0.21 0.31 0.44 0.49	0.00 0.11 0.10 0.10 0.12 0.05	0.02 -0.33 +0.18 0.33 0.29 -0.25	Total Enroll. Forced	34 52 53 19	Tot Roll Ind Lab Group Lab Sci Club Sci Demo Course Bio	0.75 0.18 0.51 0.65 0.69 0.72 0.75	0.56 0.03 0.26 0.43 0.48 0.51 0.56	0.03 0.22 0.17 0.05 0.04	-0.03 0.18 0.50 0.36 0.30 -0.37 -0.03
orced	16 Type Sr 17 Type Jr 52 Ind Lab 53 Group Lab 46 Class # 59 Writ Asii 60 Part Class	0.27 0.28 0.43 0.55 0.61 0.65	0.07 0.08 0.19 0.31 0.37 0.47	0.00 0.01 0.11 0.12 0.07 0.05	0.18 0.05 0.33 0.29 -0.25 -0.32	School Type Forced	15 16 17 52	Type J-Sr Type Sr Type Jr Ind Lab Group Lab	0.20 0.23 0.27 0.53 0.68	0.04 0.05 0.07 0.28 0.46	n.04 0.02	-0.20 0.18 -0.00 0.50 0.36
chool Type & otal Enroll orced	15 Type J-Sr 16 Type Sr 17 Type Jr 34 Tot Roll 52 Ind Lab 53 Group Lab	0.27 0.27 0.28 0.28 0.43 0.56	0.07 0.07 0.08 0.08 0.19 0.31		-0.27 0.18 0.05 0.02 0.33 0.29	Forced	16 17 34 52	Type J-5r Type Sr Type Jr Tot Roll Ind Lab Group Lab	0.20 0.23 0.27 0.28 0.53 0.68	0.05 0.07 0.08 0.29	0.02	-0.20 0.18 -0.00 0.18 0.50 0.36
	46 Class # 59 Writ Assig 60 Part Class	0.62 n 0.66	0.38 0.44 0.51	0.07	-0.25 -0.33 -0.18	100						



TABLE 58 Continued

Plains	(N	≈ 225)				
		ariable No. nd Abbrav.	Mulciple R	R Square	RSO Change	Simple R
All Variables	8	3 SCIP PS TE	0.24	0.06	0.06	0.24
Free	10		0.37	0.13	0.07	0.20
	5		0.47	0.18	0.05	0.22
	5		0.51	0.26	0.08	0.23
	3(SCIP ES Rol	1 0.56	0.31	0.05	-0.11
Total Enroll.	. 34	Tot Roll	0.05	0.00	0.00	0.06
Forced	83		u. 25	Ú.06	0.06	0.24
	11		0.38	0.14	89.0	-0.22
	5.3		0.43	0.18	0.04	0.22
	5 2 3 0		0.51 0.55	0.26 0.31	0.08	0.23 -0.11
School Type	15	Type J-Sr	0.11	0.01	0.01	-0.11
Forced	16	,,	0.20	0.04	0.03	0.20
	17		0.24	0.06	0.01	-0.14
	83		0.40	0.16	0.10	0.24
	53 52	•	0.44	0.20	0.04	0.22
	30		0.52 0.57	0.27 0.32	0.0A 0.05	0.23 -0.11
School Type &	15	Type J-Sr	0.11	0.01	0.01	.0.11
Total Enroll.	16	Type Sr	0.20	0.04	0.03	0.20
Forced	17	.,,,	0.24	0.06	0.01	-0.14
	34		0.24	0.06	0.00	υ.06
	83 53		0.40	0.16	0.10	0.24
	52		0.45	0.20 0.28	0.04	0.22
Southeas	_	$\frac{110 \text{ GeV}}{(\text{N} \approx 363)}$	0.77	0.20	0.08	0.23
Journeas		•				
		riable No. d Abbrev.	Multiple R	R Squere	RSQ Change	Simple R
All Variables Free	53 52		0.50 0.64	0.25 0.41	0.25 0.17	0.50 0.40
Total Enroll.	34	Tot Roll	0.16	0.03	0.03	0.16
Forced	53		0.51	0.26	0.23	0.50
	52	Ind Lab	0.64	0.41	0.16	0.40
School Type	15	Type J-Sr	0.04	0.00	0.00	-0.04
Forced	10	Type Sr	0.08	0.01	0.00	0.08
	17	Type Jr	0.14	0.02	0.01	0.03
	53		0.51	0.26	0.24	0.50
	52	Ind Lab	0 65	0.42	0.16	0.40
School Type &	15	Type J-Sr	0.1)4	0.00	0.00	-0.04
Total Enroll.	16	Ty⊅e Sr	0.08	0.01	0.00	0.08
Forced	17	Type Jr	0.14	0 02	0.01	0.03
	34 53	Tot Roll Group Lab	0 - 20	0.04	0.02	0.16
	52	Ind Lab	0.51 0.65	0.26	0.22	0.50
All Regio	ns	Combined	(N ≃	2162)		
			Hultiple	R	RSQ	Simple
	and	Abbrev.	R	Square	Change	R
All Variables Frae	5 2 5 3	Ind Lab Group Lab	0.34 0.55	0.12	0.12	0.34 0.33
Total Enroll.	34	Tot Roll	0.10	0.01	0.01	0.10
Forced	52	Ind Lab	0.35	0.12	0.11	0.34
	53	Group Lab	0.50	0.30	0.18	0.33
School Type	15	Type J-Sr	0.10	0.01	0.01	-0.10
Forced	16	Type Sr	0.16	0.02	0.02	0.16
	17	Type Jr	0.17	0.03	0.00	-0.07
	52	Ind Lab	0.37	0.14	0.11	0.34
	53	Group Lab	0.56	0.31	c.18	0.33
School Type &	15	Type J-Sr	0.10	0.01	0.01	-0.10
Total Enroll.	lo	Type Sr	0.16	0.02	0.02	0.16
Forced	17	Type Jr	0.17	0.03	0.00	-0.07
	34	Tot Roll	0.17	0.03	0.00	0.10
	52 53	Ind Lab Group Lab	0.37	0.14	0.11	0.3%
	,,	01000 P#0	0.58	0.31	0.18	0.33



Teacher Ranking of Test Scores as Important Grading Method had positive correlation ($\alpha < 0.001$) with

+Teacher Ranking of Lecture-Discussion as Important Learning Activity

and negative correlation ($\alpha \leq 0.001$) with

- -Teaching Experience Using Physical Science SCIP Materials
- -Use of a Tape Recorder
- -Rank of Small Group Discussion as a Learning Activity

The teachers which tend to value test scores as a grading criterion tend to favor lecture-discussion. Those teachers who favor other than test scores for grading tend to be involved with more innovative teaching materials and methods such as SCIP materials, use of tape recorders or small group discussion learning activities.

The best predictors of Teacher Ranking of Test Scores as Important Grading Method were the teacher rankings for lecture and for lecture-discussion as important learning activities. Those teachers preferring lecture, lecture-discussion or a combination of these activities tend to favor the use of test scores for grading. The removal of the influence of school size and type had no apparent effect on these relationships. See Table 55, p84.

Written Assignments

The means for Teacher Ranking of Written Assignments as Important Grading Method ranged from a low of 1.30 in the New England region to a high of 2.25 in the Rocky Mountains region. These rankings are the reverse of what was observed for test scores. This would be due, in part, to the dependence between the grading method variables because of the ranking process. These values represent a range from "used" to "3rd most used." See Table 52, p82.

Teacher Ranking of Written Assignments as Important Grading Method had a positive correlation ($\alpha \leq$ 0.001) with

+Teacher Ranking of Written Assignments as Important Learning Activity

This relationship reflects a consistency in the rankings of the learning activities and the grading methods. No negative correlates other than those among the grading method rankings were obtained.

The best predictors of Teacher Ranking of Written Assignments as Important Grading Method were the rankings of written assignments for learning activities. The rankings of participation in class discussion and performance in laboratory also made significant contributions to the prediction of the rank of written assignments for grading purpose. The weights for these variables were negative and due, primarily, to the dependence in the variables due to the ranking



process. The removal of the influence of school size and type had no apparent effects on these relationships. See Table 56, p86.

Student Participation in Class Discussion

The means for Teacher Ranking of Student Participation in Class Discussion as Important Grading Method vary from a low of about 0.85 for the Rocky Mountains region to a high of about 1.45 in the Mideast and Southeast regions. These responses generally represent the "used" category but not ranked in the top three grading methods for importance. See Table 53, p83.

Teacher Ranking of Student Participation in Class as Important Grading Method had a positive correlation ($\alpha \leq 0.001$) with

+Teacher Ranking of Science Demonstrations as Important Learning Activity.

. No negative correlates outside the grading method rankings were obtained.

The best predictors of Teacher Ranking of Student Participation in Class as Important Grading Method were the other grading method rankings. No effects were apparent when school size and type were removed. See Table 57, p88.

Student Performance in Laboratory Activity

The means for Teacher Ranking of Student Performance in Laboratory Activity as Important Grading Method ranged from a low of 1.79 in the Southeast region to a high of about 2.50 in the Farwest and New England regions. This results in a ranking of "3rd most used" t "2nd most used" as a grading criterion. See Table 54, p83.

Teacher Ranking of Student Performance in Laboratory Activity as Important Grading Method had positive correlation ($\alpha \leq 0.001$) with

+Use of SCIP Materials

+Teacher Ranking of Individual and Group Laboratory Activities as Important Learning Activity

+Teaching Experience with SCIP Physical Science Materials

and negative correlation ($\alpha \le 0.001$) with

-Teacher Ranking of Lecture-Discussion as Important Learning Activity

The ranking of laboratory performance for grading purpose tended to be higher for those teachers using SCIP materials especially in physical science courses. Teachers were consistent in their learning activity rankings and the grading criteria rankings. Those teachers favoring group or individual laboratory activities also favored laboratory performance as a grading criteria. The negative relationship indicates that those teachers who valued student



laboratory performance for grading did not consider lecture-discussion as high in importance as those who valued laboratory performance less for grading purposes.

The best predictors of Teacher Ranking of Student Performance in Laboratory as Important Grading Method were the teacher rankings for group and individual laboratory learning activities. In all regions the teachers who favored laboratory learning activities also favored student performance in laboratory or a grading criterion. The removal of the influence of school size and school type produced some change in the weights of the predictors but no consistent pattern of change was noted from region to region. See Table 58, p90.

Teacher Satisfaction with Science Teaching as a Career

The teachers were asked to indicate on a scale from "very satisfied" to "very dissatisfied" how they felt about teaching science as a career. The means for these responses are given in Table 59. The means ranged from "satisfied" to "very satisfied." The mean was 4.47 over all regions. Less than 3 percent of the respondents expressed any degree of dissatisfaction.

TABLE 59

MEANS^a AND STANDARD DEVIATIONS FOR TEACHER SATISFACTION WITH SCIENCE TEACHING AS A CAREER

	Great Lakes	Farwest	New England	Mideast	Southwest	Rocky Mountains	Plains	Southe set	Total U.S
Mean	4.55	4,53	4.45	4.52	4.40	4.30	4.32	4.37	4.47
S.D.	0.67	0.62	0.73	0.69	0.68	0.76	0.74	0.75	0.70
N	45.7	311	129	433	179	83	223	360	2175
l	etisfied = 5								

The satisfaction with science teaching variable correlated positively ($\alpha < 0.001$) in at least four of the eight regions with the following variables

- +Age of Teacher
- +School Type Junior-Senior High
- +School Type Junior High
- +Teacher Ranking of Individual Laboratory as Important Learning Activity

There were no negative correlates.

The stepwise multiple regression analyses showed no predictors which were consistent from region to region. These results are given in Table 60. In



TABLE 60

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR PREDICTION OF TEACHER SATISFACTION WITH SCIENCE TEACHING AS A CAREER

Great La	kes	$(N \approx 45)$	9)				Mideast	(N	≈ 433)				
		riabla No. d Abbrev.	Multiple R	R Square	RSQ Change	Simple R			riabla No. I Abbrav.	Multiple R	R Square	RSiQ Change	Simple R
All Variables Free		Taught Sci Innovation	0.25 0.33	0.06 0.11	0.06	0.25 0.19	All Variables Free	Non	e	****			
Total Enroll. Forced		Taught Sci	0.11 0.27 0.34	0.01 0.07 0.12	0.01 0.06 0.05	0.11 0.25 0.19	Total Enroll. Fraced	34	Tot Roll	0.04	0.00	0.00	-0.04
School Type Forced		Type J-Sr Type Sr	0.10 0.14	0.01	0.01	-0.10 0.13	School Type Forced	16	Type J-Sr Type Sr Type Jr	0.01 0.01 0.04	0.00 0.00 0.00	0.00 0.00 0.00	-0.01 -0.01
		Type Jr Taught Sci Innovation	0.17 0.29 0.36	0.03 0.09 0.13	0.01 0.06 0.05	-0.03 0.25 0.19	School Type & Total Enroll. Forced	16		0.01 0.01 0.04	0.00	0.00 0.00 0.00	-0.01 0.01 -0.02
School Type & Total Enroll. Forced	16 17 34	Type J-Sr Type Sr Type Jr Tot Roll Taught Sci Innovation	0.10 9.14 0.17 0.19 0.30 0.37	0.01 0.02 0.03 0.03 0.09 0.14	0.01 0.01 0.01 0.00 0.05	-0.10 0.13 -0.03 0.11 0.25 0.19	701.024		Tot Roll	0.06	0.00	0.00	-0.04
Farwest	(N	~ 309)					Southwest	: (N ~ 182)				
		imbla No. Abbrev.	Multiple R	R Square	RSQ Change	Simple R			iable No. Abbrev.	Multiple R	R Square	RSQ Change	Simple X
All Variables Pree	Non	e					All Variables Free	59	Writ Assign	0.22	0.05	0.05	-0.22
Total Enroll. Porced	34	Tot Roll	0.11	0.01	0.01	0.11	Total Enroll. Forced		Tot Roll Writ Ammign	0.07	0.00	0.00 0.05	0.07 -0.22
School Type Forced	16	Type J-Sr Type Sr Type Jr	0.16 0.23 0.24	0.03 0.05 0.06	0.03 0.01 0.00	-0.16 0.21 -0.17	School Type Forced	16 17	Type J-Sr Type Sr Type Jr Writ Ameign	0.08 0.08 0.08 0.24	0.01 0.01 0.01 0.06	0.01 0.00 0.00 0.05	0.08 -0.02 -0.02 -0.22
School Type & Total Enroll. Forred	16 17		0.16 0.23 0.24 0.25	0.03 0.05 0.06 0.06	0.03 0.03 0.00 0.00	-0.16 0.21 -0.17 0.11	School Type & Total Enroll. Forced	16 17 34		0.08 0.08 0.08 0.13 0.25	0.01 0.01 0.01 0.02 0.06	0.01 0.00 0.00 0.01 0.05	0.08 -0.02 -0.02 0.07 -0.22
New Engla	nd	(N ≃ 130)				Rocky Mou	nt	ains (N	× 85)			
		iable No. Abbrav.	Multiple R	R Square	RSQ Change	Simple R			iabla No. Abbrev.	Multiple R	R Square	RSQ Change	Simple R
All Variables Free	69 29 88 38	SCIP PS Roll Course Phy Sci	0.29 0.37 0.43 0.48	0.08 0.11 0.19 0.23	0.68 0.05 0.05 0.05	0.29 0.18 -0.14 0.18	All Variables Free	53 48	Ind Lab Group Lab Lect Disc Class #	0.36 0.44 0.52 0.56	0.13 0.20 0.27 0.31	0.13 0.07 0.07 0.05	0.36 0.22 0.03 -0.20
Fotal Enroll. Forced		Tot Roll Coop Staff SCIP PS Roll Course Phy Sci Degree Held	0.00 0.29 0.37 0.41 0.49	0.30 0.0H 0.13 0.19 0.24	0.00 0.08 0.05 0.06 0.05	0.00 0.29 0.18 -0.14 0.18	Total Enrull. Porced		Tut Roll Ind Lab Class # Hrm Math	0.20 0.38 0.46 0.53	0.04 0.15 0.21 0.28	0.04 0.11 0.06 0.08	0,20 0,36 -0,20 -0,22
chool Type orced	15 16 17 69 39 29 88	Type J-Sr Type Sr Type Jr Coop Staff Pursuing SCIP PS Roll Course Phy Sci	0.01 0.02 0.07 0.30 0.37 0.43	0.00 0.00 0.00 0.09 0.14 0.18	0.00 0.00 0.00 0.08 0.05 0.05	-0.01 -0.01 -0.01 -0.29 -0.16 -0.18 -0.14	School Type Forced	15 16 17 52 53 48 46	Type J-Sr Type Sr Type Jr Ind Lab Group Lab Lect Disc Class #	0.03 0.19 0.31 0.43 0.50 0.57	0.00 0.04 0.09 0.19 0.25 0.13	0.00 0.04 0.06 0.09 0.06 0.08 0.08	0.03 0.17 -0.09 0.36 0.22 0.03 -0.20
	15 16 17 34 69 39	Type J-Sr Type Sr Type Sr Fype Jr Tot Roil Coop Staff Purauing SCIP PS Roil Course Phy Sci	0.01 0.02 0.07 0.07 0.30 0.37	0.00 0.00 0.d0 0.00 0.09 0.14 0.18	0.00 0.00 0.00 0.00 0.00 0.08 0.05 0.05	-0.01 -0.01 -0.01 -0.00 -0.29 -0.16 -0.18 -0.14	School Type & Total Euroll. Forced	15 16 17 34 52 53 48 46	Type J-Sr lype Sr fype Jr For Holl Ind Lab Group Lab Lect Disc Clean #	0.01 0.19 0.31 0.13 0.44 0.50 0.57	0.00 0.04 0.09 0.11 0.70 0.25 0.31	0.00 0.04 0.06 0.02 0.09 0.05 0.08	0.03 0.17 -0.09 0.20 0.16 0.22 0.01 -0.20



TABLE 60	<u>)</u> (Continued				
Plains ((N	≃ 225)				
	Va	ariable No.	Hultiple R	R Square	RSQ Change	Simple R
All Variables Free	50) Films	0.21	0.05	0.05	-0.21
Total Enroll.	34	Tot Roll	0.06	0.00	0.00	-0.06
Forced	75		0.23	0.05	0.05	0.20
School Type	2.5	Type J-Sr	0.16	0.03	0.03	-0.16
Forced	16	Type Sr	6.16	0.03	0.00	0.08
	17		0.16	0.03	0.00	0.05
	50	Films	0.27	0.07	0.05	-0.21
School Type &	15	Type J-Sr	0.16	0.03	0.03	-0.16
Total Enroll.	16		0.16	0.03	0.00	0.08
Forced	17	Type Jr	0.16	0.03	0.00	0.05
	34	Tot Roll	0.20	0.04	0.01	-0.06
	50	Films	0.29	0.08	0.05	-0.21
Southeas	t	$(N \simeq 363)$			_	
			Multiple	R	RSQ	Simple
	an	d Abbrev.	R	Square	Change	ĸ.
All Variables Free	36	Age	0. 23	0.05	0.05	0.23
Total Enroll.	34	Tot Roll	0.02	0.00	0.00	0.02
Forced	36		0.23	0.05	0.05	0.23
School Type	15	Type J-Sr	0.00	0.00	4 00	
Forced	16		0.00	0.00	0.00	0.00
101000	17		0.00	0.00	0.00	0.00
	36		0.23	0.05	0.05	0.01
		_				,
School Type &		-,,	0.00	0.00	0.69	0.00
Total Enroll.	16		0.00	0.00	0.00	0.00
Forced	17 34		0.01	0.00	0.00	0.01
	36	Tot Roll	0.02	0.00	0.00	0.02
	- 30	Age	0.23	0.05	0.05	0.23
All Regio	ons	Combine	d (N ≃	2175)		
	Vat	riable No.	Multiple	R	RSQ	Simple
	and	Abbrev.	R	Square		R
All Variables Free	Non	e				
Total Enroll. Forced	34	Tot Roll	0.07	0.00	0.00	0.07
School Type	15	Type J-Sr	0.06	0.00	0.00	-0.06
Forced	16	Type Sr	3,00	0.00	0.00	0.09
	17	Type Jr	0.09	0.01	0.00	-0.04
School Type &	15	Type J-Sr	0.06	0.00	0.00	0.04
Total Enroll.	16	Type Sr	0.09	0.00	0.00	-0.06 0.09
Forced	17	Type Jr	0.09	0.01	0.00	n.09 -0.04
	34	Tot Roll	0.10	0.01	0.00	0.07
		·- 			J. J.	

the Great Lakes region the teachers years of experience at the secondary level and their ranking of innovative programs as important for high quality science programs were the best predictors of satisfaction. In the Farwest region, School Type was the only predictor. Teachers at the high school level tended to be more satisfied. In the New England region the best predictor of satisfaction was the teachers ranking of cooperative staff as important factor for high quality science programs. In the Mideast region there were no significant predictors of satisfaction. In the Southwest the best predictor of satisfaction was the teachers ranking of written assignments as important grading criteria. Those teachers who ranked written assignments low were more satisfied than those ranking this grading method high. In the Rocky Mountains region the importance of individual laboratory activities as judged by the teacher was an indicator of satisfaction. In the Plains region after the influences of school type were removed the importance of films for instruction as ranked by the teacher predicted satisfaction. In the Southeast the age of the teacher was the best predictor of satisfaction. The older teachers were more satisfied than the younger ones.



Section IV

Summary and Discussion

The purpose of this study was to obtain information about procedures, practices, policies and conditions related to science teaching in the public secondary schools in the U.S. in 1971. This report is an attempt to identify characteristics and conditions which are related to Science Course Improvement Project Usage, teacher self-improvement activity participation, teaching practice preferences and teacher satisfaction with science teaching careers.

Use of SCIP Materials for Teaching Secondary School Science

The Science Course Improvement Project materials tended to be in use more by the large schools than by the small schools. In addition to the size of the school, the schools which were predominately senior high schools reported more use of the SCIP materials. This finding is consistent with the history of the development of the junior high SCIP materials. By 1971 there were not many junior high schools involved with the SCIP materials.

The use of SCIP materials was related to the relative enrollments in chemistry, physics and earth science. In those schools where these course enrollments were high compared to the size of the school, the SCIP materials were more often in use. This could mean that the SCIP courses were more popular with the students. It could also mean that those teachers who have built their enrollments were also the ones who selected to use SCIP materials.

The use of SCIP materials was related to Teacher Participation in NSF Institutes and to the number of credits the teachers had in science. Some teachers probably participated in NSF Institutes to get acquainted with the SCIP materials and perhaps elected to use them with their students. Other teachers may have attended the NSF Institutes to become familiar with a specific SCIP program which they had previously selected. In either case, the institute programs generally provided the participants with additional science course credits. It is also possible that those teachers which already had numerous credit hours of college science in their teaching field tended to select the SCIP materials.

There was a tendency for those schools using SCIP materials in one of the areas of science to use SCIP materials in one or more additional areas of science. The use of SCIP physical science materials was a good predictor of use of SCIP earth science materials at the junior high level. The use of SCIP materials in biology was predicted by the use of SCIP materials in physics and/or chemistry at the high school level. This may mean that school systems tend to fit into types related to use of new developments in teaching and learning. Those teachers and schools who reported the use of learning sources other than the teacher and the textbook tend to report use of more than just one additional source or media for learning. It would be of interest to determine if the use



of these curriculum developments was characteristic only in the sciences or if the tendency could be found in the other content areas as well. If school systems or districts which are generally receptive to change, trying new things and using a variety of media could be identified, a study of the characteristics of these schools would be helpful. These characteristics might help us to determine the types of developments that are needed for learning and the best approaches for implementation of improvements.

Teacher Self-Improvement Activities

The participants in the NSF Institutes tended to have more college science credits than the non-participants. This is no doubt due, in part, to the selection criteria for many of the institute programs. The NSF Institute participants also increased their college credits in science as a part of the NSF programs. The participants in the NSF programs could be distinguished from the non participants in that they had more teaching experience, were older, included more men than women and were generally from the larger schools. Also when a teacher was selected as a participant for one NSF program, they tended to apply and be selected for other NSF programs.

Teaching Practice Preferences of Teachers

The teachers' rankings of the learning activities and the grading methods preferred were generally very consistent. Those teachers who favored the use of lecture and lecture-discussion teaching methods also favored the use of test scores for grading. These teachers did not consider laboratory performance to be of major importance. On the other hand, those teachers who favored laboratory activities ranked student performance in the laboratory high in importance.

The importance of science demonstrations was accompanied by high rankings for student participation in class for grading purposes. The teachers of biology did not rank demonstrations as high as the teachers of other courses.

There was an indication that those teachers who used SCIP materials were less favorable toward lecture-discussion and science demonstration learning activities and more favorable toward laboratory activities. These teachers also favored the use of grading methods other than test scores, such as laboratory performance.

In general these results suggest that the teachers using SCIP materials for teaching science valued the teaching activities and grading methods which are consistent with the intentions of these materials.

Teacher Satisfaction With Career

The science teachers were generally satisfied with their career choice. The factors which may have influenced their level of satisfaction varied broadly. The most satisfied teachers were those who had been at it the longest. This is no surprise since we would expect those who were dissatisfied to drop out.



APPENDIX A

PRINCIPAL'S QUESTIONNAIRE



THE OHIO STATE UNIVERSITY
CENTER FOR SCIENCE AND MATHEMATICS EDUCATION
244 Arps Hall, 1945 North High Street
Columbus, Ohio 43210

SURVEY OF SCIENCE TEACHING IN PUBLIC ELEMENTARY SCHOOLS 1970-1971

PRINCIPAL'S QUESTIONNAIRE

Ĺ		<u></u>
Principal's Name:		
Name of School:		- <u>-</u> <u>-</u> -
Address of School: _		
	Number	Street
_	City	County
_	State	Zip Code
General Instructions:	public elementary ac at large. Please ch an idea of the scope	is to be answered for an individual chool, not for the school system neck over the questionnaire to get to fuestions asked before beginer form. Check () or fill in every
Definition:	is defined as "an edupublic funds, under including any combin 8, except any upper organization." This parochial or diocese schools, technical o	saurvey a public elementary school ducational institution, operated on the principal or head teacher, sation of grade levels from K through grades under a secondary school definition excludes all private, an elementary schools, correctional revocational schools, and special d, and physically or mentally-
I. SCREENING QUESTION		
Is your school a p definition? (chec	ablic elementary scho	ol according to the above
	ed, continue with Ite	I of Section II.)
☑ No (If checked disregare	ed, indicate below who I the rest of the que	at type of school yours is end stionnaire and mail it back to us.)
Type of School		



II.	SCHOOL	ORGANIZATION AN	TO SCHEDULING

 What is the length of your regular school year? (Number of days classes are in session)

Number	οf	Dava	

Give the enrollment for each grade level in your school as of Fall, 1970.
 Give also the total school enrollment. If you do not have students in a particular grade level, please leave the corresponding space blank.

Grade Level	Enrollment	Grade Level	Enrollment
K 1 2 3 4		5 6 7 8	

Total school enrollment

3s. Indicate the prevailing way the children are organized for science in your school.

Grade	Standard Grades	Non-Graded
ĸ		
1 2	***********	
3		
5		
6 7	This area	
8	-	

3b. In what grades and for what part of a school year is science taught as a definite part of the curriculum in your school?

<u>Grade</u>	At All	Taucht Less Than Half Year	Taught Half Year Only	Taught More Than Half Year
Kinder- garten				1
First Second				
Third Fourth				
Fifth Sixth				
Seventh				
Eighth				-



Is your school departmentalized for teaching science at any grade level? (This means the children have a <u>special science</u> teacher at scheduled specified times each week) // Yes // No

If <u>yes</u>, check the grade or grades in your school in which science is departmentalized.

Grade [.]	Departmentalized (Special Science Teacher)	Crada	Departmentalized (Special Science
	reaction	Grade	<u>Teacher</u>)
Kindergarten	-	Fifth	
Piret		Sixth	
Second	Marie Company	Seventh	
Third		Eighth	
F ourth	-		

IV. TEACHING STAFF

For Item 1 the following definitions apply:

<u>Full-time teachers</u>: those teachers who occupy teaching positions which require them to be on the job on school days, throughout the school year for at least the number of hours the schools in the system are in session.

<u>Part-time teachers</u>: those teachers who occupy teaching positions which require less than full-time service. This includes those teachers employed full-time for part or the school year, part-time for all of the school year, and part-time for part of the school year.

(Substitute teachers, defined as persons employed to teach on a day-to-day basis, temporarily replacing regularly employed teachers, are NOT considered as part-time teachers in this study.)

 Specify the total number of regularly employed teachers (all grades) in your school.

<u>Sex</u>	Number Of Pull- time Teachers	Number Of Part- Lime Teachers			
Male					
Female					



Wh (C	o te heck	aches	science to oxes Which	the h App	ct ly)	111d	ren	in y	our	scho	001?		
		e Teacl ur Sch	•	1	K	1	2	3	<u>v</u>	<u>5</u>	<u>6</u>	2	<u>8</u>
۸.	vi an en	th <u>no</u> l elemer	oom teache nelp from ntary sci- cialist ltant	Ī	7	<u>/</u> 7	<u>/</u> /	_7					
В.	te:	acher w	classroo no teache lasses fo chers	8 <u>/</u>	7.	_7	口	乊	乊	<u>_</u>		乊	<i>_</i> 7
c.		special scher	science										
	1.	On th	e school	_	7 .		乊	乊	乊	乊	乊		
	2.		central e ataff	_	7 1	<u>_</u> 7	_7		乊	厂	<i>_</i>	<i>_</i>	
D.	wit men spe	h help tary a	om teache of ele- cience t or con-	r									
	1.	On the	e school	۲	7 /	7.	<u></u>		<i>[</i> 7	<u></u>	乊	<u> </u>	
	2.		central staff		7 /	7	<u> </u>	<i>_</i> 7	<i>[</i> 7	IJ	乊	IJ.	乊
Z.	Sci		al Televia rograms	lon	7	<u> </u>	<u>.</u>	丆.	ℴ	<i>□</i> 7.	口.	ℴ	<u></u>
P.	Oth	er (Spe	cify)		匚	7 <u>/</u>	7 <u>/</u>	7 /	7 <i>i</i>	7 /	7 <i>L</i>	7 /	7



V. SCIENCE BUDGET

1.	Does your school have an annual budget for the purchase of new science equipment (excluding books)? // Yes // No
	If yes, total amount of money spent or committed for 1970-71. \$
2	Does your school have an annual budget for the purchase of consumable science supplies such as chemicals, batteries, balloons (excluding books)? // Yes // No
	If yes, total amount of money spent or committed for 1970-71. \$
3.	Are your elementary teachers who teach acience permitted to purchase equipment and supplies periodically throughout the school year? // Yes // No
4.	Rave you remodeled science facilities in your school with money from the National Defense Education Act (NDEA)? // Yes // No
	If yes, has this been since September 1963? // Yes // No
5.	Rave you id money from the National Defense Education Act (NDEA) to purch science equipment? // Yes // No
	If yes, has this been since September 1968? // Yes // No
6.	Have you used money from the Elementary and Secondary Education Act (ESEA) to purchase science equipment? // Yes // No
	If yes, has this been since September 1968? // Yes // No
7.	Equipment is defined as non-contumable, non-perishable items such as microscopes, scales, models, aquariums, etc. Supplies are defined as perishable or essily breakable materials that must continually be replenished such as chemicals, dry cells, glassware, electric bulbs, cooper wire, etc.
	To what extent are equipment and supplies for science demonstrations and experiments available in your school? (check one only for each level)

Supplies	Completely Lacking	Inadequate	Adequate
K 1-3 4-6 7-8		<u>₹</u> 7 <u>77</u> 27	/ / /
Equipment K 1-3 4-6 7-8	<i>□</i>	<u>4</u> 77 171 171	

4	۶	۰	

8.			the praction one box for							ce te	xtbook	: seri	les?	
				<u>ĸ</u>	1		2	<u>3</u>	4	2	<u>6</u>	3	<u>r</u>	8
			ence textbook adopted	·		7 <u>/</u>	7 /	<u> </u>				<i></i>	7 _	_
	Sir	ngle eries	science text adopted	.book/		7 _	7 /					·	7 _	
			more science adopted				7 _	7 /			<u>/_</u> /		<u></u>	7
9.			type of roc one box for							in yo	our sc	hool?		
			Room		<u>K</u>	1	2	<u>3</u>	1	2	<u>6</u>	I	<u>8</u>	
	A.	_	ular Classro With no spo facilities science	cial	<u>/</u> /			口		口	\Box	\Box	口	
		2.	With specie ities for s	l facil- cience	<u>/</u> 7	<u></u>			\Box		\Box	\Box	<u></u>	
	B.	Spe chi	cial room to ldren go for	which science		口	\Box		口	\Box	<u>_</u> 7		<u>/</u> /	
	c.	Oth	er (specify)		口	口	<u></u>	<u></u>	\Box	<u>_</u>	<i></i>	<u></u>	D	
COU	RSE	OFFE	RINGS											
1.	vhi 71	ch u: scho	specify the se any Scien ol year. If leave the co	ce Coursc particul	ar co	oveme urse	nt Pr mater	oject ials	mate	rials	duri	ng the	e 1970	0-
<u>Sc 1</u>	ence	Cour	rse Improvem	ent Proje	ct	Num	ber c	of Chi	ldren	by G	rade I	evel		
						K	1	2 3	14	5	5 7	7] [8	7	
	Im		lence Curricument Study (
			mentary Scien [McGraw-Hill]									<u> </u>		



VI.

7

1. (Continued)

2a.

2ъ.

3a.

Science Course Improvement Project	Nu	mber	of	Chil	dren	Вy	Grade	e Le	vels
-	K	1	2	3	Į,	5	6	7	8
AAAS-Science-A Process Approach (Xerox)									
COPES-Conceptually Oriented Program for Elementary Science (New York University)									
CSLS-Child Structured Learning In Science (Florida State University)									
IPS-Introductory Physical Science (Prentice-Hall)									
ISCS-Intermediate Science Curriculum Study (Silver Burdett)									
Project (Houghton-Mifflin)									
ESSP-Elementary School Science Project (Astronomy) (University of Illinois)									
MINNEMAST-Minnesota Mathematics and Science Teaching Project									
IDP-Inquiry Development Program (Science Research Associates)									
TSM-Time-Space-Matter (McGrav- Eill)									
Other (Specify)									
	Ш							_	
Do you use <u>definite procedures</u> in you special interests, aptitudes or tale									
Yes / No									
Do you use <u>definite procedures</u> for i in <u>science?</u> Yes // No	dent	ityi	ng cl	hild:	ren ·	with	spec	:ial	inte
Is Environmental and/or Conservation	Sci	ence	tau	ght :	in y	our :	schoo	17	\Box
If yes, ensuer 3b, and If no, go to Item 4a.	3c.								

1		

				Gr	ade L	evel			
	K	1	2	<u>3</u>	4	<u>5</u>	<u>6</u>	7	8
Taught separately	\Box		\Box				\Box		
Taught with science	\Box		\Box	\Box	· <u>/</u> 7	\Box	\Box		\angle
Taught with social studies	<u> </u>	\Box	\Box	\Box	\Box	\Box	\Box	\Box	\Box
Taught with two or more subjects including science			\Box	口	\Box	\Box		\Box	
Taught with two or more subjects not including science	口		\Box	\Box	\Box	\Box	\Box	\Box	
Other (Specify)									
		/77	77	,	,—,	/-7	,-7	<u> </u>	/ /
Specify any facilities (such school forest) that are a conservation science in your	os an Vailab	outd	oor e	ducet	ion 1	ahora	torv	scho	 0]
school forest) that are a conservation science in your	es an	outd ole fo	oor e	ducet	ion 1	abore	ntal	scho	ool f
school forest) that are a conservation science in your	es an	outdole fool.	oor er tea	ducet ching	ien 1 envi	abors ronmo	tory,	scho and/o	rel
Specify any facilities (such school forest) that are a conservation science in your list health taught in your school other subjects?	es an	imari	oor er tea	ducat ching a se	icn 1 envi	abors ronmo	ental	scho and/o	rela
Is health taught in your school to other subjects?	as an veilab school pr	imari:	oor er tea	a se	ien 1 envi	abors ronmo	ject	or in	rel
Is health taught in your sche to other subjects?	as an	imari	oor er tea	a se	parate	abors ronmo	ject	or in	rel
Is health taught in your school to other subjects? Taught separately Taught vith science Taught vith physical	as an veilab school pr	imari:	oor er tea	a se	parat	abors ronmo	ject	or in	relation for the second for the seco

4 b.	18 D8										
		rcotics or drug abuse e									
	If ye subje	s, is it taught primari: cts?	ly as	a sej	arate	subj	ect o	or in	relat	tion t	o other
			K	1			_	2			<u>8</u>
	Taugh	t separately								\Box	
	Taugh	t with science									
	Taugh	t with health	口	\Box	\Box	\Box	\Box	\Box	\Box	\Box	\Box
		t with physical cation	IJ	\Box	口	\Box	口	\Box	\Box	\Box	\Box
	_	t with two or more jects including science		\Box	\Box	口	\Box	\Box	\Box	\Box	\Box
	sub,	t with two or more jects not including ence	\Box	口	\Box	\Box		\Box	ฆ	\Box	\Box
	Other	(specify)									
			\Box	\Box	口	\Box	口	\Box	\Box	\Box	\Box
la.		dition to assistance from	scien —	ce av	ailab						
la,	superv	risory help in teaching Yes	scien	Ce av	ailab						
la.	superv	visory help in teaching	scien	Ce av	ailab						
la.	superv	risory help in teaching Yes	scien /_ ch ap	T N	eilab D	le fr	om vi	thin '	the s	chool	system?
la,	superv	visory help in teaching Yes s, check items below whi	scien /- ch ap	T N	eilab o th on	le fr	om vi	knov:	the s	of s	system?
la,	superv	Yes c, check items below whi General elementary sup General elementary sup	scien ch ap ervise	T M ply. or without with	eilab o th on	le fro	cm wi	know:	the s	of s	system?
la,	If yes	Yes c, check items below whi General elementary sup General elementary sup science	scien /- ch ap ervis ervis aulta	ply. or with the state of the	eilab o th on th spe uperv	le fro	neral compo	know	the s ledge e in	of s	system?
la,	If yes	Yes c, check items below whi General elementary sup General elementary sup science Elementary science con	ch appervise crvise crv	ply. or with the state of the	eilab o th on th spe uperv	le fro	neral compo	know	the s ledge e in	of s	system?
la,	If yes	Yes s, check items below whi General elementary sup General elementary sup science Elementary science con Classroom teacher with	ch appervise crvise crv	ply. or with the state of the	eilab o th on th spe uperv	le fro	neral compo	know	the s ledge e in	of s	system?
la,	If yes	Yes s, check items below whi General elementary sup General elementary sup science Elementary science con Classroom teacher with High school science tea	ch appervise crvise crv	ply. or with the state of the	eilab o th on th spe uperv	le fro	neral compo	know	the s ledge e in	of s	system?



If you answered "No" to question la, DO NOT answer THIS question.

1b. If consultant help in science is available, to what extent do teachers make use of it? (Consider all types checked in cuestion la and check only ONE box for each grade group in your school)

Grade	Rarely or Never (less than once a month)	Occasionally (about once a month)	Very Often (at least once a week)
ĸ		\Box	
1			
2	\Box	\Box	\Box
3		\Box	\Box
4			
5			
6		\Box	
7			\Box
8			\Box

If you answered "No" to question la, DO NOT answer THIS question.

- 1e. If consultant help is available in your school, to what extent is each of the following ways of working used at each grade group level? Complete every box for grade groups in your school by writing in one of the numbers of the following code:
 - 1 Rarely or Never Used 2 Used Occasionally 3 Used Very Often

Consultant's		Grade	Group	
Ways of Working	<u>K</u>	<u>1-3</u>	4-6	<u>7-8</u>
Planning or consulting with teachers Teaching science lessons within class- rocms				
Introducing science units				
Providing materials Helping plan Field trips				
Evaluation of science teaching Demonstration teaching before teacher				
groups				
Organizing or directing teacher workshops Working with small groups of children				
Other (Specify)				



2. What are the opportunities teachers in your school have for in-service science education? (check as many boxes as apply for each function)

		Spo	nsorsh:	<u>lp</u>	
In-Service Science Education Activity	Local School Level	School System Level	State Level	College Sponsored	Any Other Sponsorship (Specify)
Teachers meetings					
Curriculum develop- ment and revision					
Elementary science courses					
Elementary science workshops					
Visitations and demonstration teaching					
Television and radio programs					
Other in-service science education activities (Specify)					

END OF PRINCIPAL'S QUESTIONNAIRE
THANK YOU FOR YOUR COOFERATION



APPENDIX B

SCIENCE TEACHER QUESTIONNAIRE

THE OHIO STATE UNIVERSITY CENTER FOR SCIENCE AND MATHEMATICS EDUCATION 244 Arps Hall, 1945 North High Street Columbus, Ohio 43210

SURVEY OF SCIENCE TEACHING IN PUBLIC SECONDARY SCHOOLS

SCIENCE TEACHER QUESTIONNAIRE Name of School: Address of School: Street County State Zip Code General Instructions: This questionnaire is to be answered by the individual secondary school science teacher. Please check over the questionnaire to get an idea of the scope of questions asked before beginning to fill out the form. Check (J) or fill every item that applies. Definition: For purposes of this survey, a secondary school science teacher is defined as "a teacher who teaches at least one science course or subject in any grade level or combination of grade levels from 7 through 12, in any school designated as a public secondary school." I. SCHOOL ORGANIZATION Check the grade levels that are included in your school. K-12 ____ 8-12 ____ 7-8 ____ 1-12 ____ 9-12 ____ 7-9 7-12 ____ 10-12 ____ Other _ (specify) II. TEACHER CHARACTERISTICS Check (✓) or fill in the blank. 1. Age in years ____ 2. Sex: male ____



female

•

3.	Please check the degree(s) you minor subject matter fields o		ify the major and
	Degree(s) Held	Subject Matter F Major	ields Minor(s)
	B.S. or B.A		
	M.S. or M.A		
	Ed.D		
	Ph.D		
	Specialist		
	Non-degree		
	Other (specify)		·
4.	Are you now working on a forma	al degree program?	Yes No
	If yes, what degree ?		
	Major subject matter field		
	Minor subject matter field(s)		
5.	Plezse specify the number of of in either quarter hours or sen		the following area
	Undergraduate Work	Quarter Hours	Semester Hours
	Biological Sciences	· · ·	
	Physical Sciences		
	Earth Science		
	Mathematics		
	Science Teaching Methods		
	Student Teaching in Science		
	Graduate Work		
	Biological Sciences		
	Physical Sciences		
	Earth Science		
	Mathematics		
	Science Teaching Methods or Science Education		

3

6.	If you have attended any sponsored In-service Institutes during the
	period 1960-70, please circle the year(s) in which you attended
	the institute(s). For example, if you attended a National Science
	Foundation (N.S.F.) Academic Year Institute in 1965-66, circle
	"65". If you have attended an in-service Institute during 1969-70,
	circle "69".

Kind of Institute

N.S.F. Academic Year	60	61	62	63	64	65	66	67	68	69	70
N.S.F. In-service	60	61	62	63	64	65	66	67	68	69	70
N.S.F. Summer	60	61	62	63	64	65	66	67	68	69	70
N.S.F. Research	60	61	62	63	64	65	66	67	68	69	70
Other Sponsored Institutes (specify)											
	60	61	62	63	64	65	66	67	68	69	70
	60	61	62	63	64	65	66	67	63	69	70

7. If you teach or have taught one or more of the Science Course Improvement Projects (eg., IPS,ISCS,ESCP,SSSP, IME, BSCS, CHEM Study, CBA, PSSC, HPP, Portland Project ...), since September 1968, please supply the following information about each project.

Science Course		Attendance at Workshop or Institute		
Improvement Project		Yes	<u>No</u>	Institute
				
				
	 .			
				

The following definitions apply for item 8 below:

<u>Full-time teachers</u>: those teachers who occupy teaching positions which require them to be on the job on school days, throughout the school year for at least the number of hours the schools in the system are in session.

<u>Part-time teachers</u>: those teachers who occupy teaching positions which require less than full-day service.



•				4				
	Substitute teachers: thos basis, temporarily replacement considered as part-ti	ing regularly coplo	ved taachere	E day-to-day . They are				
8.	On what basis are you now	employed by the scl	nool system i	?				
	_	As a substitute						
		Other (specify)	**					
9a)	Number of years of teachi			chool				
b)	Number of years of teaching (Include the present school	ng experience in a s	econdary sch	col				
c)	c) Total number of years of teaching experience (Include the present school year.)							
	Number of years you have (Include the present school	taught science in a	secondary sc	hool				
e)	Number of years at present (Include the present school	school system or d	istrict					
III.	TRACHING LOAD							
	Please list below all subjin the related information	ects or courses you	are teaching	g, and fill				
·	Example A teacher who teaches two sections of 10th grade BSCS Biology - Blue Version with 20 students in one section and 28 students in the other section would fill in the information as follows:							
	BSCS Blue Version		2	24				
<u>!</u> -	Subject/Course	Grade <u>Level(</u> s)	No. of Sections or Classes	Average Class Size				
-								



<u>5</u>

IV. SPECIAL SCIENCE FACILITIES AND AUDIO-VISUAL AIDS

1. Check the special science facility or facilities that is/are available for your use in teaching science in your school. How much use do you make of each facility that is available?

Special Science Facility	Availa	bilitv		Usane	
	Yes	Ro	Often		Rarely
·	1			elly (about	(less
	ì		once &	once a	than once
	 	<u> </u>	vieck)	month)	a month)
Auto-tutorial laboratory	<u> </u>				
Closed circuit television	<u> </u>				
Computer terminal(s)	<u></u>				<u> </u>
Greenhouse					
Ham radio station					
Land laboratory					
Nature trail(s)	<u> </u>				
Observatory					
Planetarium	<u> </u>				
Science darkroom	<u> </u>				
Ventilated animal house					
Weather station					
Other (specify)	·				
]		i		

2. Check the audio-visual aids that are available to you in teaching acience. How much use do you make of each kind of aid that is available?

Audio-visual Aid	_Availa	bility		Urage	
	Yes	No	Often	Occasion-	Farely
				aliy (about	(less
	•	1 1	once a	once a	than once
			wcek)	month)	a month)
Motion picture projector					
Filmloop projector	<u> </u>				
Slide projector					
Overhead projector					
Opaque projector					
Micro-projector					
Phonograph					
Tape-recorder					
Television					·
Commercial models (eg.eye ear, molecular models)					
Commercial charts					



6

V. SCIENCE TEACHING

Special Instruction

Items 1,2,3,4 and 5 below have been designed to provide information specific to one science class. If you teach only one class of science, respond to these same items with respect to that class. You may skip directly to item 1 below. If you teach note than one science class, please read the following before you begin item 1.

In order to ensure that the secondary school science classes in this survey constitute a random sample, we request your cooperation in selecting one of your science classes, about which we hope to obtain specific information regarding the science teaching practices.

The method of selecting this science class from all your science classes is outlined below. In selecting a science class for the information needed in Section V, Items 1-5, of the questionnaire, treat each group of students or unit as a separate class.

- A. Order your science classes in numerical order, starting with "1" for the first science class that you teach each day, "2" for your second science class, and so on, ending with your last science class for the day.
- B. Please select <u>one</u> of the science classes according to the following selection criteria:

Science Class Selection Numbers

04

03

02

01

- a) If the total number of science classes that you teach is greater than or equal to 4, select the 4th science class.
- b) If the total number of science classes that you teach is 3, select the 3rd science class.
- c) If the total number of science classes that you teach is 2, select the 2nd science class.



			2					
V.	SCIENCE TEACHING (Continued)							
1.	Title of science course		_					
	Grade level(s)	Class size	_					
2.	Please check the kind of room that you specified above.	ou use to conduct the	science class					
	Laboratory or special science room	_						
•	Classroom with portable science kits							
	Classroom with no science facilities	or kits						
	Other (specify)							
3a)	Please specify the kind of curriculum you use for the science class specifi Single textbook	materials and/or texed above. Check as ma	tbooks that my as applies.					
	Separate laboratory manual							
	Single textbook including laboratory	manual						
	Multiple textbooks							
	Multiple textbooks including laboratory manual							
	Locally-prepared materials							
	Other (specify)							
			. 77					
ъ)	Please supply the following information curriculum materials used for the science apace is insufficient, please continue attach a separate list.	nce class specified -	houp TE					
	<u>Title</u>	Publisher	Publication Date					
•								
,								
•								
•								
•								
•								
•								
-								
-								
-								



4	b	
1	ĸ	

4.	With respect to the <u>science class specified above</u> , rank the <u>three</u> learning activities that you use most often. Use "1" for the most often used activity, "2" for the next most often, and "3" for the third most often used activity. Mark all other activities which you use with a check (\sqrt{)}.						
	Lecture	Individual laboratory activity	y				
	Lecture-discussion	Group laboratory activity					
	Small group discussion	In-class written assignments					
	Science demonstrations	Excursions or field studies					
	Instructional films	_ Programed instruction					
	Independent study	_ Auto-tutorial instruction					
	Others (specify)	Televised instruction					
5.	grading methods that you use often used grading method, for the third most often use particular grading method, grading Method Test scores Written assignments Student participation in classes		st				
	Student performance in laboratory activity						
	Student performance in science projects						
	Student interest in science						
	Other (specify)						
VI.	MISCELLANEOUS						
1.		the following factors to you in obtaity science program in your school.	ining				
	Factors	Very Important 1 2 3 4	Not Important				
	Innovative science programs						
	Administrative support						
	Science facilities						
	Teacher's salary						



п	9

1.	(Continued)					
	Factors		Very Important	2	_ 3	Not Importar 4 5
	In-service ed	lucation				
	Cooperative s	taff				
	Small classes Number of dif preparations	ferent subject	•—— <u> </u>			
٠	Lighter teach Others (speci					
						
2.		are you with t he spaces below			career ?	
•	Very satisfied	Satisfied	Neutral	D	lssatisfied	Very

END OF THE SCIENCE TEACHER QUESTIONNAIRE
THANK YOU FOR YOUR COOPERATION



Bibliography

- Baker, James H. A Survey of Science Teaching in the Public Secondary Schools of the Plains, Rocky Mountain, and Southeast Regions of The United States in the 1970-71 School Year. Unpublished doctoral dissertation, The Ohio State University, 1973.
- Buckeridge, Ellen C. A Survey of Science Teaching in the Public Secondary Schools of the New England, Mideast, and Southwest States of the United States. Unpublished doctoral dissertation, The Ohio State University, 1973.
- Chin, Long Fay. A Survey of Science Teaching in the Public Secondary Schools of the Great Lakes and Farwest Regions of the United States in the 1970-71 School Year. Unpublished doctoral dissertation, The Ohio State University, 1971.
- Dixon, W. J. (Ed.) <u>BMD Biomedical Computer Programs, X Series Supplement,</u> University of California Publications in Automatic Computation, No. 2. Berkeley, University of California Press. 1970.
- Gertler, Diane B. <u>Directory of Public Elementary and Secondary Day Schools:</u>

 1968-1969. National Center for Educational Statistics, U.S. Department of Health, Education and Welfare, U.S. Government Printing Office, Washington, DC. Volumes I and IV, 1970.
- Howe, Robert W., et al. A Survey of Science Teaching in Public Schools of the United States (1971) Volume 3 Elementary. ERIC Information Analysis Center for Science, Mathematics and Environmental Education. Columbus, Ohio. 1974.
- Kahn, Gerald and Hughes, Warren A. <u>Statistics of Local Public School Systems</u>, 1967. Office of Education, U.S. Government Printing Office, Washington, DC. March 1969.
- Obourn, Ellsworth S. and Brown, Kenneth E. <u>Science and Mathematics Teachers in Public High Schools</u>, Office of Education (OE-29045), U.S. Department of Health, Education and Welfare, U.S. Government Printing Office, Washington, DC, 1963.
- Schlessinger, Fred R., Howe, R. W., White, A. L., Chin, L. F., Baker, J. H. and Buckeridge, E. C. <u>A Survey of Science Teaching in Public Schools of the United States (1971): Volume 1 Secondary Schools</u>, Center for Science and Mathematics Education, The Ohio State University, 1973.
- Steiner, Robert L., White, A. L., Howe, R. W., Maben, J. W., Nelson, B. E. and Webb, M. R. A Survey of Science Teaching in Public Schools of the United States (1971): Volume 4 Elementary Schools, Center for Science and Mathematics Education, The Ohio State University, 1974.

